



Universidad de Oviedo

**“NEW PERSPECTIVES IN THE ANALYSIS OF
CULTURAL PARTICIPATION AND ITS LIMITS”**

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ABSTRACT

This thesis studies different aspects of cultural participation. The benefits of participation in the arts are numerous and achieving an adequate level of cultural capital is an important objective of nations, since it is a key resource in the development of better societies with higher social cohesion and higher participation in civic life. Moreover, the consumption of culture has also numerous positive externalities at an individual level, such as improving mental health or enhancing cognitive skills and, thus, earnings. This thesis examines the profile of cultural attendants and the particularities of non-attendance, identifying the most relevant barriers to cultural participation and to study how to boost cultural consumption overcoming those limits.

First, we study the main reasons why individuals do not attend more often contemporary music concerts and the cinema. We find that lack of interest acts as the main barrier to cultural consumption. Although excessive pricing is also a barrier, our results suggest that economic restrictions are not the biggest problem. We suggest that it would be more useful to focus cultural policies on increasing the interest in cultural goods rather than on subsidizing prices. As lack of interest relates to the role of preferences and higher education is a key determinant in cultural consumption, long-term educational policies could be the answer to enhance cultural participation.

Then, we analyze the important disparities found between the declared motives of cultural non-participation in two successive waves of the Survey on Cultural Habits and Practices in Spain to understand how a change of the cultural VAT affected cinema consumption. Before the tax change, the main declared reasons for not attending more frequently the movies were lack of interest, lack of time and high prices. After the tax change, high prices were declared as the main reason of non-participation by more than two thirds of the respondents. However, these complaints about prices were not consistent with cinema consumption, which remained stable before and after the VAT change. Focusing on the analysis of cinema participation, we find that, interestingly, answers to evaluative (subjective) questions probably are (un)intentionally biased, whereas answers about (objective) behavior are more reliable than those regarding evaluations or opinions.

Since the demand for culture is determined by experience processes, in which people develop their taste for culture through consumption, the problem of lacking interest in culture is probably linked with education. To unravel how to overcome this barrier, we explore the particularities of education as a limit for cultural consumption.

We analyze the effect of education on attendance to cinema, performing arts and visits to sites of cultural interest. We find that the effect of education changes across activities, being its marginal effect larger for highbrow activities than for popular culture. By contrast, when a certain level of

education is given, higher income increases participation to the cinema more than to theaters or museums. Probably, this relates to one particularity of highbrow cultural consumption: it involves the comprehension of complex symbolic and aesthetic elements, and, in this sense, individuals' ability to value and understand culture depends more on education than on income.

Nevertheless, high prices (or low earnings) also discourage people from consuming more cultural contents. One possible solution to democratize culture could be to facilitate its access by broadcasting spectacles to audiences on the internet. In this line, we examine the relation between live and online consumption of theatre and musical performing arts. Our results point to two different profiles of consumers regarding the consumption channel (live and online), but also a complementarity between live and online consumption. Therefore, the online channel could be a valuable tool for spreading access to culture that might overcome some restrictions on live cultural participation, such as high prices and time constraints.

RESUMEN

Esta tesis estudia diferentes aspectos de la participación cultural. Los beneficios de la participación en las artes son numerosos y lograr un nivel adecuado de capital cultural es un importante objetivo para todas las naciones, ya que constituye un recurso clave en el desarrollo de sociedades con mayor cohesión social y participación en la vida cívica. Además, el consumo de cultura tiene numerosas externalidades positivas a nivel individual, como mejorar la salud mental o las habilidades cognitivas. Esta tesis examina el perfil de los consumidores de cultura y las particularidades de la no asistencia, identificando las barreras más relevantes a la participación y estudiando cómo impulsar el consumo cultural superando esos límites.

En primer lugar, estudiando las principales razones por las cuales no se asiste más a menudo a conciertos de música contemporánea y al cine, encontramos que la falta de interés es la principal barrera al consumo cultural. Aunque un precio demasiado alto también es un límite, nuestros resultados sugieren que las restricciones económicas no son el mayor problema. En consecuencia, probablemente sería más útil centrar las políticas culturales en aumentar el interés por la cultura que subsidiar los precios. Como la falta de interés se relaciona con el papel de las preferencias, y la educación superior es un determinante clave del consumo de cultura, las políticas educativas a largo plazo parecen ser la vía más adecuada para incrementar la participación cultural.

En segundo lugar, analizamos las diferencias en la principal causa de no asistencia al cine entre dos oleadas sucesivas de la Encuesta de hábitos y prácticas culturales en España, para investigar el efecto de una subida del IVA cultural sobre el consumo de cultura. Antes del cambio de impuestos, las principales razones por las que los individuos declaran no acudir mayor frecuencia al cine fueron la falta de interés, la falta de tiempo y los precios altos. Después, más de dos tercios de los encuestados declararon que no asistían más al cine porque el precio era elevado. Sin embargo, estas quejas sobre los precios no fueron consistentes con el consumo del cine, que se mantuvo estable antes y después del cambio del IVA. Analizando las razones de no asistencia al cine, encontramos que, curiosamente, las respuestas a preguntas relativas a evaluaciones u opiniones (subjetivas) están con probabilidad sesgadas, mientras que las respuestas sobre el comportamiento (objetivo) son más fiables.

Dado que la demanda de cultura depende de las experiencias previas de consumo, en las cuales se desarrolla el gusto por la cultura, el problema de falta de interés seguramente esté relacionado con la educación. Con objeto de investigar cómo superar la barrera de la falta de interés, analizamos el efecto de la educación en la asistencia al cine, las artes escénicas y las visitas a lugares de interés cultural. Encontramos que el efecto de la educación cambia entre actividades, siendo su efecto marginal mayor en la alta cultura que en la cultura popular. Por el contrario, dado un cierto nivel de

educación, mayores ingresos aumentan la asistencia al cine más que al teatro o a los museos. Probablemente esto se deba a que el consumo de alta cultura requiere comprender elementos simbólicos y estéticos complejos, y ésta capacidad depende más de la educación que de los ingresos.

No obstante, los precios altos o los ingresos bajos también desaniman a los individuos a consumir más cultura. Una posible solución para democratizar la cultura podría ser facilitar su acceso retransmitiendo espectáculos culturales a través de Internet. Por ello, examinamos la relación entre el consumo en directo y en línea del teatro y las artes escénicas musicales. Nuestros resultados apuntan a dos perfiles diferentes de consumidores con respecto al canal de consumo, pero también a una complementariedad entre el consumo en directo y en línea. Por lo tanto, el consumo en línea podría ser una herramienta valiosa para facilitar el acceso a la cultura superando algunas restricciones de la participación cultural en directo, como los precios elevados o las restricciones de tiempo.

INTRODUCTION

This thesis studies different aspects of cultural participation. According to UNESCO (2012: 51), cultural participation can be defined as “*participation in any activity that, for individuals, represents a way of increasing their own cultural and informational capacity and capital, which helps define their identity, and/or allows for personal expression*”. The benefits of participation in the arts are numerous and achieving a good level of cultural capital is an important objective of nations, since it is a key resource in the development of better societies with higher social cohesion and higher participation in civic life (Ateca-Amestoy et al., 2017, McCarthy et al., 2004, or Campagna, et al., 2020). In fact, consumption of culture has numerous positive externalities at an individual level such as improving mental health (O'Neill, 2010, or Clements-Cortés, 2017) or enhancing cognitive skills and, thus, earnings (Reeves and de Vries, 2019).

In trying to reach this goal, the first step is to provide the best conditions for the access to culture to all citizens. Then, authorities should put the effort in enhancing cultural consumption with their cultural policies. To this end, it is essential to examine the profile of cultural attendants and the particularities of non-attendance, to know better *who* consumes cultural goods and *how* these goods are consumed. In this regards, it is also fundamental to identify the most relevant barriers to cultural participation as well as to analyze how to overcome them to facilitate cultural engagement. Information on the profile of consumers and the barriers to participation is useful for both public and private sectors. It helps both companies and policy makers to reach their target population in promotion and advertisement campaigns, facilitates the development of new cultural products more appealing to the public, and makes easier to design cultural policies making culture more accessible for everyone. All these improvements are valuable to increase cultural participation and consumption.

In this line, the objective of this thesis is twofold. First, to examine the profile of cultural consumers and non-attendants, identifying the main barriers to cultural participation. Second, to study how to increase cultural consumption by overcoming those barriers. Finally, we analyze the role that new technologies may have in reaching new audiences.

Before beginning with a summary of each chapter of this thesis, it is worth giving an insight into the state of the art. Culture includes a wide range of activities, from attending humor monologues to symphony orchestra concerts, going to the movies or visiting archaeological sites. The different cultural activities are typically grouped into highbrow and lowbrow activities. The former includes activities such as attending a classical concert, an opera, a live play, a dance performance, or visiting an art museum, whereas the in the latter group we can mention watching the TV, attending popular

music concerts or going to the cinema to watch famous blockbusters. Understanding highbrow culture might be quite complex in some cases, requiring a certain endowment of cultural capital to fully disentangle the messages contained (Notten et al. 2015). In this sense, cultural capital and education are sometimes a premise to consume highbrow culture. On the contrary, lowbrow activities are easier to follow and pursue a slightly different goal, being more like a source of entertainment (Reinecke et al., 2011) than a mental challenge. As a result, highbrow cultural goods are usually more elitist, whereas lowbrow culture is more mainstream. In any case, as pointed out by Friedman (2011), the distinction between highbrow and lowbrow culture is becoming less clear nowadays with the expansion of high culture to wider audiences and how contemporary cultural industries have developed products that are more “aestheticized” and intended for a more selective audience, with examples such as jazz music or some films and books.

Considering differences between highbrow and lowbrow culture, the profile of the cultural consumer differs (see, for example, López-Sintas and García-Álvarez, 2004). Traditionally, the distinctive characteristics of the consumer of highbrow culture was being an older female with a high level of education (Reeves, 2015), while, in lowbrow culture, the profile was quite different, predictably a male with lower education (Bihagena and Katz-Gerro, 2000). However, nowadays we observe the rising phenomenon of cultural omnivores, with digital technologies helping traditional consumers becoming omnivores, but without increasing (highbrow) cultural participation among more deprived groups.

In this regard, there is a long stream of the literature studying how individual characteristics explain cultural consumption. Age, gender, education level, personal or household income, labor situation or marital status, among other individual characteristics have been widely analyzed. Females tend to consume more culture (see, for example Cuadrado and Frasquet (1999), Kane (2004), or Muñiz et al. (2014)), however, men are generally more interested in music than women (Ateca-Amestoy and Prieto-Rodríguez, 2013; Gray 2003). The effect of age is complex (see Scherger (2009) for a general discussion). While some find that younger people participate more (Andreasen and Belk, 1980; Cuadrado and Frasquet, 1999; Willekens and Lievens, 2014), others find a U-shaped effect (Muñiz et al., 2014) or no clear effect (Falk and Katz-Gerro, 2016). A well-known stylized finding in the literature is that the higher the educative level, the higher the cultural attendance (Andreasen and Belk, 1980; Ateca-Amestoy and Prieto-Rodríguez, 2013; Borgonovi, 2004, D’Angelo et al., 2010; O’Hagan, 1996; Willekens and Lievens, 2014). The effect of individual and family earnings is positive (Ateca-Amestoy and Prieto-Rodríguez, 2013; Falk and Katz-Gerro, 2016; Seaman, 2005; Sisto and Zanola, 2010; Gray, 2003), but its effect is not just economic though. Perceiving a higher income is usually associated to a higher interest in culture and often implies having more cultural capital. Whether it is education or income the most important for cultural participation is often questioned. The answer to this dilemma seems to be pretty clear: once the individual has enough educative level, the importance of earnings and prices is placed into a second position (Katz-Gerro, 1999; Kirchberg,

1998; Kolb, 1997; Seaman, 2005; Willekens and Lievens, 2016). Finally, culture is mainly found as an urban phenomenon (Ateca-Amestoy and Prieto-Rodríguez, 2013; Cuadrado and Frasset, 1999; Gray 2003; Muñiz et al., 2014).

Many authors have pointed that family responsibilities affect negatively cultural attendance (Andreasen and Belk, 1980; Ateca-Amestoy and Prieto-Rodríguez, 2013; Prieto-Rodríguez and Fernández-Blanco, 2000). The number of children or the size of the household are often related to lower levels of cultural consumption (Muñiz et al., 2014). Also, marriage affects cultural consumption (López-Sintas and García-Álvarez, 2004), since it has effects on free time, among others. The effect of labor status in cultural participation is mainly explained by income and social status (Sokolov, 2019; Weingartner and Rössel, 2019). Cultural participation is frequently higher for those of high class and higher earnings (Reeves and de Vries, 2019). Even though those employed have less time availability, they rather spend their leisure time in culture than in other alternatives.

Although conditional on such features, some authors have studied the barriers of participation, i.e., which are the most important reasons explaining why people do not consume more culture is still unclear (Kirchberg, 1998; Kolb, 1997; O'Hagan, 1996; Prieto-Rodríguez and Fernández-Blanco, 2000; Willekens and Lievens, 2014, 2016). This literature has focused in two main types of barriers. On the one hand, culture has been sometimes classified as a luxury good, especially highbrow culture (Sokolov, 2019) since cultural consumption increases rapidly with income. When incomes are too low or prices too high, some cultural activities become unaffordable. Thus, economic barriers can be a limit for cultural consumption, being one classical reason for the governments to fund and subsidize culture. On the other hand, cultural participation is strongly affected by education. Through education, individuals acquire knowledge to develop their interest in culture, which makes them demand and attend more cultural activities. Since income and education are highly correlated, whether the most relevant barrier is education or income is often questioned. However, so far, many authors agree that education is the prerequisite in cultural consumption, placing the importance of economic barriers usually into a second position (Katz-Gerro, 1999; Kirchberg, 1998; Kolb, 1997; Seaman, 2005; Willekens and Lievens, 2016). Furthermore, the new age of technology has expanded the ways people consume culture. Internet is now an enormous source of cultural contents, and whether it makes culture more accessible for the whole public is an interesting question that also remains unsolved.

This thesis is structured in four chapters. Chapters one and two pursue the first objective, to determine the main barriers to cultural participation studying attendance to cinema and music concerts. Chapters three and four study how to overcome these barriers. To do so, Chapter 3 clarifies the importance of education and income on cultural consumption, while Chapter 4 outlines the profile of the new consumer of culture and how the new age of technology affects the consumption of culture.

The first chapter of this thesis is called "*Identifying the barriers to cultural participation*". It analyzes the main reasons explaining why individuals do not participate more frequently in two cultural activities: contemporary music concerts and the cinema. In this study, we use as database the Survey of Cultural Habits and Practices (SCHP) 2010-2011, conducted in Spain by the Ministry of Education and Culture. Given the large number of people who do not attend any of the activities regularly and how the information about the dependent variable was collected, for the empirical analysis we use count data models with zero inflation. According to tests based on information criteria, the negative binomial distribution with zero inflation is the most appropriate model. In this chapter, we find that lack of interest is the main barrier in cinema and live music concerts attendance. Although excessive pricing also limits cultural participation, it is not the most important problem. As a conclusion, cultural policies would need to focus not on subsidizing prices but in increasing the interest in cultural goods, and the best way to enhance cultural participation would be probably through the educative system.

By the time when the Chapter 1 was written, the wave of the SCHP 2014-15 was released. Our first idea was to extend the previous analysis by adding the new data and verifying whether the barriers to cultural consumption remained stable over time. Nonetheless, we found important disparities between the results of each wave of the survey, and we decided to study the possible reasons explaining this change. Hence, what is now the second chapter of this thesis was conceived to study the differences between the declared barriers for cultural participation between the waves SCHP 2010-11 and SCHP 2014-15. In 2012, a normative change took place: the government increased the Value Added Tax (VAT) for cultural products by 13 points. A consequence of this tax change in the 2014-15 wave of the SCHP, was an important rise in the number of people declaring prices as the main limit of cultural consumption. To understand how the new VAT change affected cultural consumption, we focused on studying in depth one cultural activity, the cinema. However, while doing so, we found interesting results regarding the reliability and the validity of the responses to diverse questions in opinion polls. For this reason, we decided to examine response bias in surveys, and its implications for research. As a result, in Chapter 2, we find that answers to evaluative (subjective) questions probably are (un)intentionally biased, whereas answers about (objective) behavior are more reliable than those regarding evaluations or opinions.

The second objective of this thesis is to study how to overcome the hurdles of cultural consumption to facilitate cultural commitment. So far, literature has identified the most relevant barriers to cultural participation: education and income. However, there are two questions to be solved. On the one hand, how to overcome the barrier of education. In this regard, a question arises. Does the effect of education vary between highbrow and lowbrow cultural activities? On the other hand, how to overcome the economic barrier. Maybe the new age of technology is the solution. Could online consumption of culture act as a democratization tool? Chapters 3 and 4 of this dissertation aim to bring light on these two queries.

It is noteworthy to mention that the effect of education on cultural participation is double. Education affects cultural consumption directly but also indirectly, given that the higher the level of education, the higher the expected income and, as a result, higher cultural consumption. Therefore, it is probably education, instead of income, the socioeconomic variable that has the greatest impact on cultural participation. To deeply understand how education determines the consumption of culture, Chapter 3 of this thesis, called "*The changing role of education as we move from popular to highbrow culture*", analyzes how the effect of education changes among cultural activities. To do so, using information on attendance to cinema, performing arts and visits to sites of cultural interest, we estimate a Zero Inflated Ordered Probit using the 2006 and 2015 Spanish modules of the European Union Statistics on Income and Living Conditions (EUSILC). We find that the effect of education varies between activities, being its marginal effect more relevant for highbrow activities than for popular culture. On the contrary, given a certain level of education, an increase in income will bring more people to the cinema than to theaters or museums.

One possible way to consume culture overcoming the economic restriction could be to find cultural contents freely on the internet. Numerous questions appear in this context, two of them have a particular significance concerning enabling the access to culture for everyone, regardless of income. Does the online consumption of culture complement or substitute live consumption? Is the profile of the consumer of live and online culture the same? Answering these two questions would give an insight in the ability of the online channel to overcome the problem of the price of culture.

In the last chapter of this thesis, Chapter 4, "Playing a play: online and live performing arts consumers profiles and the role of supply constraints" the relation between live and online highbrow performing arts consumption is examined. Specifically, we analyze whether restrictions on live cultural participation can be overcome by online consumption and the differences in the profiles of live and online consumers. To this end, using the Survey of Cultural Habits and Practices in Spain 2014–2015, two Bivariate Probit models using information about online and live consumption of highbrow performing arts in Spain are estimated. We separately analyze theatre and musical performing arts (ballet, opera, Spanish operetta and classical music concerts). Our results show that the profiles of live and online cultural consumers differ. However, we also find a complementarity effect between live and online consumption. Therefore, the online channel could be a valuable tool for spreading access to highbrow culture that might overcome some restrictions on live cultural participation, such as high prices or time constraints. Alternatively, if this is true only for people already consuming culture but online supply is not attracting new consumers, the online channel would help just to reproduce old patrons of inequality in cultural access but not to democratize highbrow culture.

In summary, this thesis comprises an analysis of cultural participation from different perspectives, focusing mainly on the profiles of the consumers. Along the four essays, we identify education as the

main explanatory variable for cultural consumption, whereas the importance of prices and income as constraints to participation are weaker. Besides, new technologies, especially online cultural supply are facilitators to the access to cultural contents for the wide public. Several interesting policy implications can be derived from the conclusions of this dissertation.

CHAPTER 1

IDENTIFYING THE BARRIERS TO CULTURAL PARTICIPATION¹

Abstract

It seems to be a foregone prerequisite to designing efficient cultural policies to have a good knowledge of the target population of such policies. If the main aim of the cultural policies is to democratize public access to culture, give access to those people that do not participate should be key. To do so, it is mandatory to understand which are the barriers that exclude them and differentiate these barriers from those declared by people that already participate. Using as database the Survey of Cultural Habits and Practices 2010-2011, conducted by the Ministry of Education and Culture, we analyze the declared causes that limit films' and concerts' attendance. Considering the large proportion of people who do not attend regularly to these quite popular cultural activities the econometric analysis is based on count data models. According to tests based on information criteria, the most appropriate model to analyze the limits on access to culture is the negative binomial distribution with zero inflation.

1. INTRODUCTION

Increasing cultural engagement is one key objective for all developed countries due to the positive externalities of cultural consumption (O'Neill, 2010; Clements-Cortés, 2017). But if the main aim of the cultural policies is to democratize public access to culture, to give access to those people that do not participate is key. Governments should, then, pay attention to the high proportion of non-participants to cultural activities found repeatedly in any kind of surveys. The design of the cultural

¹ This chapter is co-authored with María José Pérez-Villadoniga and Juan Prieto-Rodríguez.

policy should be based on a good understanding about which are the barriers that exclude non-participants and differentiate these barriers from those declared by people that already participate.

The extent to which this problem is endogenous to the population, who is not interested in attending cultural activities, or if the difficulty is the existence of economic barriers in the access to culture is yet unclear. Whether the solution is to provide equality of access to culture or to fund cultural activities, especially those demanded freely by people, is another dilemma to solve. In any case, governments have potential to facilitate cultural participation. However, public investment in public policies is controversial. On the one hand, public expenses in funding cultural products have been found to be regressive (Prieto-Rodríguez et al, 2005) as cultural goods have high income elasticity. On the other hand, if the problem is lack of interest in culture, the need would be educative programs with a long-term approach. Therefore, to design cultural policies properly, it is vital to identify the main reasons limiting cultural participation and further analysis on the profile of attendants and non-attendants.

There is a large stream of literature studying the effect of socioeconomic characteristics of cultural participants (see Seaman, 2005; Willekens and Lievens 2014; Sisto and Zanola 2010). However, less attention has been given to the causes of non-attendance. Most previous analysis on cultural participation has concentrated on factors limiting consumption only for those who actually participate or explored why attendants believe others do not attend (Samdahl and Jekubovich, 1997). Furthermore, most analyses focus on highbrow culture (museums (Kirchberg, 1998), performing arts (Kolb, 1997), high arts (O'Hagan, 1996), heritage (Willekens and Lievens, 2016)). People who already attend highbrow culture can be a legitimate target of cultural policies, since removing the barriers of this particular group for a larger cultural participation will increase *cultural democracy*, at least with respect to them. However, it will also polarize cultural participation, going against *cultural democratization*.² Therefore, analyzing barriers to highbrow consumption by people already involved in culture seems a rather sterile effort to enhance cultural democratization. The main aim of democratization should be to remove barriers for those not attending at all any kind of cultural activity. This research tries to close this gap by focusing on the barriers for both consumers and non-participants in two popular activities, namely music concerts and the cinema.

² The distinction between cultural democratization and cultural democracy, as well as the different aims of the cultural policies oriented by these two principles was discussed many years ago by Evrard (1997). In his view, cultural policies, at least in Europe, are more oriented “towards the democratization of culture. They aim to disseminate major cultural works to an audience that does not have ready access to them, for lack of financial means or knowledge derived from education.”

We decided to analyze these two activities because their barriers on the supply side are much smaller than those of highbrow art performances. For example, it is likely to have a concert of a local band or a relatively closer small cinema in any rural area, whereas the supply of ballet concerts or important museums is constrained to bigger cities. Besides that, in order to analyze cultural participation, we consider individuals as utility maximizers constrained by budget and time restrictions (Gray, 2003). Cinema and popular music concerts are two time-intensive activities performed outdoors, which enables us to assess the role of time constraints.

Our database comes from the Survey on Cultural Habits and Practices 2010-2011, conducted by the Spanish Ministry of Education and Culture. This database is representative of the Spanish population and it conveys information about several aspects of cultural consumption. As empirical model we use a ZINB (zero inflated negative binomial), particularly suitable to deal with unobserved heterogeneity and excess of zeros (see, for example, Greene 1994).

The paper is structured as follows. Section 2 presents the data base used. Section 3 analyzes the methodology. Section 4 describes the empirical model. Section 5 offers our results and, by last, section 6 contains the main conclusions.

2. LITERATURE REVIEW

Since Baumol and Bowen (1966), in cultural economics it is common to study socioeconomic profiles of cultural consumers. Many years of research have shown that gender matters. Females tend to consume more culture, but it depends on the activity. Many studies on highbrow culture find women more likely to participate in cultural activities and also attending more frequently (Cuadrado and Frasquet, 1999, Kane 2004, Muñiz et al., 2014). On the contrary, men are generally more interested in consuming music than women (Ateca-Amestoy and Prieto-Rodríguez, 2013, Gray 2003). The effect of age is ambiguous (see Scherger, 2009, for a general discussion). While some find that younger people participate more (Andreasen and Belk, 1980, Cuadrado and Frasquet, 1999, Willekens and Lievens, 2014), others find a U-shaped effect (Muñiz et al., 2014) or no clear effect (Falk and Katz-Gerro, 2016). A well-known stylized finding in the literature is that the higher the education level, the higher the cultural attendance (Andreasen and Belk, 1980, Ateca-Amestoy and Prieto-Rodríguez, 2013, Borgonovi, 2004, D'Angelo et al., 2010, O'Hagan, 1996, Willekens and Lievens, 2014). Income has also a positive effect on cultural participation (Ateca-Amestoy and Prieto-Rodríguez, 2013, Falk and Katz-Gerro, 2016, Seaman, 2005, Sisto and Zanola, 2010, Gray, 2003). Finally, culture has been mainly found an urban phenomenon (Ateca-Amestoy and Prieto-Rodríguez, 2013, Cuadrado and Frasquet, 1999, Gray 2003, Muñiz et al., 2014).

Specific research on the barriers to cultural participation is more scarce. Although there are some examples, they are quite heterogeneous (Kirchberg, 1998, Kolb, 1997; O'Hagan, 1996; Prieto-Rodríguez and Fernández-Blanco, 2000; Willekens and Lievens, 2014, 2016). Furthermore, Milner (2004) has profiled the typical non-attendant. Despite the absence of a large corpus of literature on this matter, barriers to cultural consumption can be grouped essentially into three domains: lack of interest, lack of income and lack of time.

The *lack of interest in culture* seems a matter of lacking enough education level. As noted previously in the literature, education is strongly and positively related to cultural participation (Seaman, 2005). Cultural products, unlike other goods and services, are social experiences (experience-goods, Lévy-Garboua and Montmarquette, 1996). Some relevant features of these products are not known when individuals decide whether or not to purchase them, and the global evaluation of the product can only be done through consumption. Through education, individuals acquire enough knowledge to develop cultural taste and interest in culture and, as a consequence, to demand and attend cultural activities. Furthermore, certain education level is needed to be able to enjoy and fully appreciate culture. Also, mainly because some cultural consumption requires certain skills to understand it, in some educative programs there are subjects related to culture, such as music or art (Gray 2003).

Prices, individual earnings and household income have been largely considered as reasons for non-attendance to different cultural activities. *Lack of economic resources* to attend cultural activities is one motive for governments to fund culture. In fact, higher income is always found to increase cultural consumption (Ateca-Amestoy and Prieto-Rodríguez, 2013; Falk and Katz-Gerro, 2016). We presume that the higher income, the greater cultural participation, given that culture is a luxury good (see Prieto-Rodríguez et al. 2005; Lévy-Garboua and Montmarquette, 2002, Katsuura, 2008). However, as cultural consumption is time-intensive, there is a trade-off, and earnings may partially be offset by a higher opportunity cost of time (Ekelund and Ritenour, 1999).

Whether it is education or income the main limit to cultural participation is often questioned (Willekens and Lievens, 2016; Suarez-Fernandez et al. 2019). The answer to this dilemma seems to be pretty clear: once the individual has enough education, the importance of earnings and prices is placed into a second position (Katz-Gerro, 1999, Kirchberg, 1998, Kolb, 1997, Seaman, 2005, Willekens and Lievens, 2016). As Suarez-Fernandez et al. (2019) argue, education has a double effect: *“A higher level of education leads to greater interest and taste for culture increasing the demand of culture. But education can also indirectly affect cultural consumption because the higher the level of education, the higher the expected income and, therefore, the greater the cultural consumption”*.

Regarding *lack of time availability*, many authors have found family responsibilities negatively affecting cultural participation (Andreasen and Belk, 1980, Prieto-Rodríguez and Fernández-Blanco,

2000). The number of children or the size of the household are often related to lower levels of cultural consumption. Life cycle hypothesis can help explaining these findings. According to this hypothesis, consumption decisions are made considering both the current life stage and the expected resources availability over lifetime (Deaton, 2005). In this line, cultural consumption tends to be higher in the younger and older cohorts, and lower when family responsibilities are bigger (Muñiz et al., 2014), also explaining the complexity of age effects.

In this paper, we analyze how important these three categories are for both non-attendees and participants. As discussed above, implications for the cultural policy are completely different in both cases.

3. DATA BASE

For the empirical analysis, we use as database the Survey of Cultural Habits and Practices (SCHP) in Spain, conducted by the Ministry of Culture and Sport along 2010 and 2011. During these two years, every three months, an individual from a random sample of households was interviewed. This results in a total of 14,486 observations (as individuals were not followed over time, the database is cross-section). This survey is representative of the Spanish population and it gathers information about socio-economic characteristics such as gender, age, education level, employment status, family responsibilities and region of residence. It is the most suitable survey for our purpose as it also provides information on cultural participation. Descriptive statistics of the main variables are displayed in Table 1.

Individuals were asked how many times they had attended to popular music concerts and to the cinema within the last three months, as well as which was the main reason why they had not attended more frequently. It is noticeable that 67% and 88% of the respondents had not been on the cinema or to music concerts within the last three months, respectively. The average attendance for cinema is 1.10 times per quarter, whereas for popular music concerts it is 0.26. Due to the large proportion of non-attendees and the high standard deviation of participation, the average attendance is derived from the high attendance of a small group of individuals. Regarding non-attendance reasons, lack of interest and time restrictions are the most declared reasons for not attending more frequently to both activities.

Table 1. Descriptive statistics.

Variable	Definition	Mean	SD
<i>Dependent variables</i>			
Cinema	Number of times the individual has attended the cinema within the last three months	1.10	2.52
Concerts	Number of times the individual has attended music concerts within the last three months	0.26	1.18
<i>Independent variables</i>			
Age	Individual's age	44.22	19.10
Female	Individual's gender	0.52	0.50
Less than primary education	Highest education level attained: Less than Primary	0.25	0.43
Primary Education	Highest education level attained: Primary Education	0.31	0.46
Secondary Education	Highest education level attained: Secondary Education	0.14	0.34
Two-year Vocational Training (I)	Highest education level attained: Vocational Training (before bachelor)	0.06	0.24
Two-year Vocational Training (II)	Highest education level attained: Vocational Training (after bachelor)	0.08	0.27
Three-year University Degree	Highest education level attained: University degree	0.07	0.26
Five-year University Degree	Highest education level attained: University degree	0.10	0.30
House Size	Number of individuals living in the household	3.12	1.34
Children under 18	Number of children under 18 years old	0.57	0.88
Single	Civil status: single	0.15	0.36
Married	Civil status: married	0.61	0.49
Dependent	The individual is still living with his/her family	0.21	0.41
Other family situation	Other situation: widowed, divorced, separated...	0.03	0.18
With children	The individual has children on charge	0.43	0.50
Without children	The individual does not have any children on charge	0.21	0.41
Capital city	The individual lives in a capital city	0.41	0.49
City	Population over 100,000	0.09	0.28
Town	Population between 50,001 and 100,000	0.10	0.30
Small town	Population between 10,001 and 50,000	0.21	0.41
Village	Population below 10,000	0.19	0.39
Employed	Labor situation: employed	0.45	0.50
Unemployed	Labor situation: unemployed	0.12	0.33
Retired	Labor situation: retired	0.20	0.40
Disabled	Labor situation: disabled	0.01	0.08
Student	Labor situation: student	0.09	0.29
Housewife/husband	Labor situation: housewife or house husband	0.12	0.32
Other labor situation	Other labor situation: military services...	0.01	0.09
PCA Equipment	Principal component analysis: equipment at home	0.74	3.96
PCA Informatics	Principal component analysis: informatics equipment	0.90	0.75
PCA Reading	Principal component analysis: interest in reading	0.00	0.94
<i>Cinema non-attendance</i>			
Supply	Supply issues: distance, variety, purchasing difficulties	0.10	0.30
Interest	Lack of interest: preferring other activities	0.30	0.46
Time	Lack of time availability: responsibilities and other causes	0.30	0.46

Social	Lack of social relations: not having someone to go with	0.03	0.17
Price	Ticket price is too high	0.27	0.45
Concerts non-attendance			
Supply	Supply issues: distance, variety, purchasing difficulties	0.22	0.42
Interest	Lack of interest: preferring other activities	0.31	0.46
Time	Lack of time availability: responsibilities and other causes	0.27	0.44
Social	Lack of social relations: not having someone to go with	0.02	0.13
Price	Ticket price is too high	0.18	0.39

4. METHOD

Concerning cultural participation, population can be classified into individuals who have participated, *attendants*, and those who have not, non-attendees. The major group is constituted by non-attendees and, within this group, we can distinguish two types of non-participation. On the one hand, some individuals never attend and are not expected to do so, namely, absolute zeros. On the other hand, there are individuals who are potential consumers but, eventually, did not participate, classified as occasional zeros. We are interested in the reasons that lead each individual to belong to one group or another.

Given the high proportion of individuals who declare that they have not attended any cultural activity during the period, we estimate a zero inflated negative binomial (ZINB) model, the most appropriate when dealing with zero inflation in a count dependent variable. This model allows us to distinguish *absolute zeros* and *occasional zeros* (see, for example, Ateca-Amestoy and Prieto-Rodríguez, 2013). An observation is an absolute zero when the individual is not attending music concerts or the cinema in any case (non-goer). An occasional zero is an individual who has not participated within the last three months but could have participated a positive number of times if some circumstances were different (potential consumer). Accordingly, ZINB models include two components, (1) the count equation (*intensity equation*), cataloguing attendants depending on the intensity of their participation, and the zero-inflation equation (*participation equation*), classifying individuals into attendants and non-participants.

We included the same set of explanatory variables in both equations except for employment status, which is included only in the intensity equation, thus assuming that the current labor situation is related to budget and time restrictions, but not with preferences. This specification will help to identify the econometric model without relying just on its non-linearity.

We estimate a ZINB model for each activity as follows:

$$Attendance_{i,j} = f(Population_i, Age_i, Gender_i, Edu_i, Labor_i, House_i, PCA_i, Barrier_{i,j})$$

Where $Attendance_i$ represents the number of times that individual i has attended to the activity j (cinema or music concert), within the last three months i. e. the frequency (or *intensity*) of participation.

With respect the covariates, first of all, we include, as geographical control variables, a set regional dummies and the population size of the city of residence, $Population_i$. Cultural participation is influenced by agglomeration economies (Gray, 2003), so we expect metropolitan citizens to show a higher likelihood and intensity of participation (Muñiz et al., 2014) probably as a result of wider supply and lower travel costs. For example, as larger cities have a greater volume of potential consumers, the most important concerts held in Spain take place in Madrid or Barcelona. Meanwhile, many small towns do not even have cinemas.

Second, we include individuals' age, Age_i , and its square allowing us to account for its possible nonlinear effect. Given that cultural taste is developed with time, we expect an increase in cultural participation with age (Gray, 2003). Obviously, this is not applicable to all cultural products, such as those focused on teenagers or children (Willekens and Lievens, 2014). We also control for gender, $Gender_i$, as women usually show higher participation rates (see Ateca-Amestoy 2008).

Education level, Edu_i , comprises a set of dummy variables which indicate the highest level of education attained, including Primary education, Secondary education, two-year Vocational training before bachelor, two-year Vocational training after bachelor, three-year University and five-year University, being less than Primary education the reference category.

We also include a set of dummies to control for employment status, $Labor_i$: Employed, Unemployed, Retired, Disabled, Student, Housework and *another labor situation* as reference category. Labor situation is included only in the intensity equation as it is related to budget and time restrictions, but we hypothesize that it is not determinant for the decision of whether to participate or not. Occupational situation is an indicator of income but also determines free time availability, so its effect on cultural participation can be either positive or negative.

Concerning household features, $House_i$, we consider the number of members who live at home (*House size*), whether the individuals are still living with their family (*Dependent*), individuals not in charge of children (*Without children*), individuals in charge of children under 18 (*Children under 18*), and being single or married. As the reference category, we set the remaining family situations (*Another family situation*), such as widowed, divorced, separated.

Income has a positive effect on cultural participation (Seaman, 2005; Sisto and Zanola, 2010). Unfortunately, we lack available information on income. To proxy individuals' income and wealth, we have followed Fernández-Blanco et al. (2015) and conduct two PCA (principal component analysis). Firstly, we include a PCA to proxy physical cultural capital, PCA_i , grouping domestic households' objects whose consumption is related to culture, such as e-books, CDs, MP3s, cameras or DVDs (*PCA Equipment*). In addition, a second PCA was conducted for computer equipment, including having computer, tablet, internet access or smartphones (*PCA Informatics*). Also, education, which is closely related to income, could be understood as a proxy of earnings. Similarly, to proxy 'cultural interest' we conducted a PCA for interest in reading (*PCA reading*), including variables such as time spent or frequency of reading non-professional books. All factor analysis' results can be found in the Annex.

Finally, we include a set of dummy variables, $Barrier_i$, containing the declared reasons for not attending more often to popular music concerts or to the cinema. The categories included are: (i) lack of time together with family responsibilities, especially relevant because of the high time-intensity of going to the cinema or to a popular music concert; (ii) lack of interest, which includes the preference for watching TV or listening to the radio; (iii) reasons related to supply (difficulties to get tickets, lack of information or lack of variety); (iv) social restrictions, such as the lack of friends or family for attending to this events; (v) high ticket prices, which is the omitted category in order to be used as reference demand curve.

5. RESULTS

ZINB models allow us to analyze the differential effects that each explanatory variable may have on the intensity of attendance (namely, *intensity equation*) and on the probability of ever participating (namely, *participation equation*). This second equation allows classifying individuals into potential consumers and non-consumers.

5.1 Participation equation

From participation equations, displayed in columns B and E of Tables 2 and 3, respectively, we find some significant common effects that describe a common profile of cultural consumers. Note that a negative sign is interpreted as increasing the probability of ever participating (i.e. reducing the likelihood of being an absolute zero).

Regarding gender, men have more chances to participate in both activities, since the effect of being a male is negative on the probability of belonging to the absolute zeros group. This result contradicts previous analysis on (highbrow) performing arts, such as Borgonovi (2004), Kane (2004) or Ateca-Amestoy (2008). As expected (see, for example, Ateca-Amestoy and Prieto-Rodriguez, 2013), human capital, approximated by education level, increases the likelihood to attend the cinema and music concerts. The lower the education level, the more likely that the individual belongs to the absolute zero category. This effect is stronger in the case of cinema participation. Concerning cultural capital, we find that the greater interest in reading (*PCA reading*), the lower the probability of being a non-attende of both activities.

While some variables have a similar effect on both cinema and popular music consumption, others show different impact depending on the activity. First, older individuals exhibit lower chances of being potential consumers of cinema, while age is not explanatory of popular concerts attendance. Household structure only affects cinema consumption. We find that the larger the household size, the more likely to be a non-participant. In contrast, the number of children under 18 years old reduces the probability of being an absolute zero. Also, the size of the population where the individual lives has a positive effect on the likelihood of going to the cinema: compared to those living in villages, individuals who live in cities or towns are more likely to attend the movies. Finally, physical cultural capital (*PCA equipment* of the household) increases the chances of being a potential participant to popular music concerts.

With respect to the reasons of non-attendance, note that we set as the reference category *Prices*, i.e. people that declare they do not attend with higher frequency because the ticket prices are too high. These people, given the prices they face, are not willing to move downwards along their demand curve. Hence, by using this group as the omitted category, the signs of the restriction variables indicate how demand curve shifts for those declaring other barriers.

In both activities, the main reason increasing the likelihood of being an absolute zero is lack of interest. Particularly, in the case of cinema, at the mean, lack of interest has twice the effect of not having anyone to go with and three times the effect of lack of time or supply scarcity. Moreover, all barriers have a positive and significant coefficient, implying that pricing is the least likely reason for being a never-goer. Considering concerts, the second most important reason of non-attendance is lack of time, while supply scarcity and lack of someone to share the experience with have no statistically different effect relative to high prices.

5.2 Intensity equation

Columns A and D of Tables 2 and 3, respectively, display the estimations of the intensity equations. Coefficients of the intensity equation should be interpreted considering the individual as a (potential) consumer, i.e. not an absolute zero. We observe larger differences between cinema and concerts regarding intensity than in the participation equation.

For both activities, education has a positive effect on the frequency of attendance but only for high levels. Additionally, physical cultural capital (*PCA Informatics*) has a positive effect on the intensity of attendance.

Most of the socioeconomic variables affect differently the frequency of attendance to these two activities. While older individuals go to the cinema less often than young people, age does not explain concert's intensity of participation. Among potential consumers, men attend more frequently popular concerts, whereas gender is not explanatory of the intensity of cinema demand. In the case of cinema, singles attend more habitually, while those with children consume less amount of movies. Having children under 18 years old at home decreases the frequency of cinema attendance. With regard to labor status, disability decreases the intensity of cinema demand. The size of the population of the city of residence is strongly and positively related to the number of times an individual goes to the cinema, but not to music concerts. Lastly, those who are more interested in reading (*PCA reading*) go more often to the cinema.

Overall, regarding the barriers of attendance, lack of interest is the most important reason why potential customers do not consume more cinema or concerts. Lacking someone who share the activity with is much more important for concerts than for cinema. Also, scarcity of supply is more restrictive for concerts.

5.3 Margins

Given that ZINB is not a linear model, the estimated coefficients cannot be interpreted as elasticities. The overall marginal effects of each independent variable on cinema and concerts attendance are displayed in columns C and F of Tables 2 and 3, respectively.

Focusing on the motives of non-attendance, we find lack of interest is the highest barrier for cultural consumption. When the individual declares lack of interest as the main motive for not attending more the activity, cinema and concerts consumption is 50.66 and 63.29 percent lower, respectively, compared to those who declare high prices. Lacking time availability or somebody to attend the activity also have significant negative elasticities, although their effect is lower.

Table 2. ZINB Cinema attendance

Variables	Intensity (A)		Participation (B)		Margins (C)	
	Coef.	Std. Err.	Coef.	Std. Err.	ey/ex	Std. Err.
Age	-0.033 ***	-3.00	0.061 ***	3.13	-3.118 ***	-6.32
Age square	0.050 ***	3.78	0.004	0.21	1.084 ***	3.55
Male	-0.008	-0.21	-0.397 ***	-4.68	0.087 ***	4.23
Primary education	-0.008	-0.09	-0.461 ***	-3.70	0.075 ***	3.01
Secondary education	0.090	0.99	-1.062 ***	-6.66	0.056 ***	5.14
Two-year Vocational training (I)	-0.003	-0.02	-1.140 ***	-5.76	0.020 ***	3.59
Two-year Vocational training (II)	0.157	1.53	-0.874 ***	-4.65	0.034 ***	4.90
Three-year University degree	0.040	0.39	-1.745 ***	-8.34	0.032 ***	4.79
Five-year University degree	0.214 **	2.29	-1.591 ***	-8.42	0.054 ***	6.42
Single	0.402 *	1.70	-0.019	-0.05	0.063 **	1.96
Married	0.138	0.62	0.066	0.21	0.061	0.52
Dependent	0.273	1.26	-0.580	-1.57	0.078 **	2.00
With children	-0.230 *	-1.92	-0.047	-0.27	-0.089 *	-1.88
Without children	-0.068	-0.53	0.038	0.22	-0.019	-0.75
House size	0.035	1.43	0.148 ***	2.66	-0.102	-1.47
Children under 18	-0.131 ***	-4.35	-0.238 ***	-3.37	-0.030 *	-1.91
Employed	0.156	0.96	---	---	0.070	0.96
Unemployed	0.007	0.04	---	---	0.001	0.04
Retired	-0.115	-0.60	---	---	-0.023	-0.60
Disabled	-1.025 ***	-2.67	---	---	-0.006 **	-2.67
Student	0.112	0.66	---	---	0.011	0.66
House wife/husband	-0.012	-0.07	---	---	-0.001	-0.07
Capital city	0.229 ***	3.55	-0.310 **	-2.47	0.152 ***	5.87
City	0.212 **	2.54	-0.352 *	-1.88	0.033 ***	4.21
Town	0.180 **	2.08	-0.413 **	-2.26	0.036 ***	4.28
Small town	0.189 ***	2.84	-0.217 *	-1.70	0.064 ***	4.24
PCA Equipment	0.007	0.96	0.002	0.42	0.004	0.91
PCA Informatics	0.126 ***	5.80	-0.021	-0.39	0.123 ***	4.66
PCA Reading	0.079 ***	3.34	-0.622 ***	-10.58	-0.092 ***	-7.80
Supply	0.153 **	2.48	0.390 ***	2.72	-0.002	-0.29
Interest	-0.305 ***	-3.65	1.783 ***	13.64	-0.508 ***	-17.13
Time	0.066	1.41	0.526 ***	4.59	-0.047 ***	-2.95
Social	-0.130	-0.95	0.852 ***	3.40	-0.020 ***	-3.90
Constant	0.422	1.19	-2.364	-3.72		

Table 3. ZINB Music concerts attendance

Variables	Intensity (D)		Participation (E)		Margins (F)	
	Coef.	Std. Err.	Coef.	Std. Err.	ey/ex	Std. Err.
Age	0.002	0.08	0.060	1.61	-1.675 ***	-2.19
Age square	-0.030	-1.16	-0.012	-0.31	-0.498	-1.02
Male	0.361 ***	4.05	-0.320 *	-1.78	0.258 ***	7.23
Primary education	-0.146	-0.75	-0.603 *	-1.90	0.058	1.47
Secondary education	-0.158	-0.76	-1.013 **	-2.37	0.029	1.47
Two-year Vocational training (I)	0.280	1.10	-0.041	-0.10	0.018 *	1.75
Two-year Vocational training (II)	0.388 *	1.67	-0.080	-0.23	0.033 ***	2.75
Three-year University degree	0.072	0.31	-0.782 *	-1.92	0.028 **	2.49
Five-year University degree	0.377 *	1.77	-0.166	-0.49	0.045 ***	2.95
Single	-0.121	-0.26	-0.522	-0.70	0.031	0.61
Married	-0.527	-1.22	-0.263	-0.38	-0.214	-1.12
Dependent	-0.104	-0.29	0.013	0.02	-0.022	-0.40
With children	0.257	0.80	0.901	1.64	-0.146	-1.55
Without children	0.024	0.07	0.454	0.77	-0.052	-1.17
House size	-0.074	-1.34	-0.060	-0.52	-0.127	-1.02
Children under 18	-0.052	-0.75	0.215	1.60	-0.097 ***	-2.95
Employed	-0.189	-0.43	---	---	-0.085	-0.43
Unemployed	-0.308	-0.71	---	---	-0.038	-0.71
Retired	-0.036	-0.08	---	---	-0.007	-0.08
Disabled	-1.248	-1.03	---	---	-0.008	-1.03
Student	-0.122	-0.28	---	---	-0.011	-0.28
House wife/husband	-0.315	-0.69	---	---	-0.037	-0.69
Capital city	0.152	0.99	0.027	0.10	0.057	1.21
City	-0.106	-0.44	-0.075	-0.17	-0.005	-0.37
Town	-0.255	-1.33	-0.495	-1.28	0.001	0.06
Small town	0.019	0.12	-0.198	-0.69	0.028	1.09
PCA Equipment	-0.001	-0.21	-0.376 ***	-4.44	0.119 ***	5.03
PCA Informatics	0.150 ***	2.99	0.102	0.96	0.080 *	1.81
PCA Reading	0.036	0.70	-0.598 ***	-4.42	-0.073 ***	-2.86
Supply	0.031	0.30	-0.349	-1.24	0.031 *	1.73
Interest	-0.568 ***	-2.76	1.762 ***	5.57	-0.626 ***	-10.60
Time	0.250 **	2.07	0.894 ***	4.00	-0.084 ***	-2.76
Social	-0.623 *	-1.71	0.096	0.13	-0.011 **	-2.21
Constant	-0.679	-0.87	-2.683	-2.11		

On the basis that the key objective of any cultural policy trying to democratize culture will be to reduce the proportion of individuals who do not consume any culture at all, in what follows, we analyze the marginal effects of the barriers to access culture on the probability of being an absolute non-participant.

In the survey, individuals are given five mutually exclusive groups of categories as their main limit to cultural attendance. Therefore, choosing a particular barrier will also imply not declaring any other category. Thus, the estimated marginal effects in Tables 4 and 5, capture the effect of switching from one barrier to another on the probability of being an absolute non-participant for cinema and concerts attendance, respectively. Negative values in these tables would be interpreted as a drop in the probability of being a never-goer. For instance, the last figure in column 4 of Table 4, means that if eventually an individual stopped declaring lack of interest as the main barrier to the attendance to movies, and declared prices as the main problem, the probability of being an absolute non-participant would decrease by 25.4 percent. Figures in these tables could be interpreted as indicating which kind of policies can be more efficient in reducing the number of non-participants. A significant negative coefficient would be a signal regarding which barrier is more correlated with the fact of being a non-attendant. Therefore, cultural policies targeting that specific barrier could be more effective in making culture more accessible.

Table 4. Average marginal effects of being an absolute zero in cinema demand

	Social (1)		Supply (2)		Time (3)		Interest (4)		Price (5)	
	dy/dx	t	dy/dx	t	dy/dx	t	dy/dx	t	dy/dx	t
Social	-	-	0.066	1.74	0.047	1.32	-0.134	-3.69	0.119	3.27
Supply	-0.066	-1.74	-	-	-0.019	-1.01	-0.200	-9.25	0.053	2.69
Time	-0.047	-1.32	0.019	1.01	-	-	-0.181	-10.14	0.073	4.5
Interest	0.134	3.69	0.200	9.25	0.181	10.14	-	-	0.254	12.94
Price	-0.119	-3.27	-0.053	-2.69	-0.073	-4.50	-0.254	-12.94	-	-

Note: figures show the changes in the probability of being an absolute zero associated to a discrete change from declaring the column restriction to the row one.

In Table 4, we find that interest (column 4) is the only category where all estimated average effects are significant and negative. This means that switching from declaring interest as the main restriction to consume cinema to any other reason significantly decreases the probability of being an absolute zero. In other words, it seems that once the lack of interest is not the main limit, it is more likely to be a potential consumer. Therefore, policies aimed to increase interest in cinema may have the expected positive effect on participation. With respect to social, supply and time restrictions (columns 1, 2 and 3, respectively) results are mixed. For instance, removing time restrictions may not have the desired effect among low interested people, increasing in 18.1 percent the probability of being a never-goer.

Finally, from column 5, we can infer that policies focused on subsidizing prices might polarize cultural consumers of cinema as they do not seem to be effective in attracting new consumers, but in increasing attendance mainly among those who already consume movies.

Table 5. Average marginal effects of being an absolute zero in popular music concert demand

	Social (1)		Supply (2)		Time (3)		Interest (4)		Price (5)	
	dy/dx	t	dy/dx	t	dy/dx	t	dy/dx	t	dy/dx	t
Social	-		0.077	0.57	-0.136	-1.04	-0.267	-1.96	0.017	0.13
Supply	-0.077	-0.57	-	-	-0.213	-4.30	-0.344	-6.05	-0.060	-1.26
Time	0.136	1.04	0.213	4.30	-	-	-0.131	-3.01	0.153	4.08
Interest	0.267	1.96	0.344	6.05	0.131	3.01	-	-	0.284	5.75
Price	-0.017	-0.13	0.060	1.26	-0.153	-4.08	-0.284	-5.75	-	-

Note: figures show the changes in the probability of being an absolute zero associated to a discrete change from declaring the column restriction to the row one.

With respect to popular music concerts attendance, displayed in Table 5, conclusions are similar to those on cinema, being long-term policies focused on increasing interest the most effective ones to reduce non-participation.

In sum, if the main objective of the public sector is to facilitate the access to culture for all citizens, policies should be oriented to increasing interest in culture in order to be effective. Since lack of interest in culture is probably connected with lack of cultural capital, these policies should be linked with the formation of tastes through education.

6. CONCLUSIONS

This paper studies the determinants of cinema and popular music concerts' attendance, focusing on the barriers to participation. To explain cultural consumption, we consider individuals' socioeconomic characteristics and the declared reasons explaining why they do not participate more often. Given the evidence of over-dispersion and excess of zeros (probably due to unobserved heterogeneity), and according to the hypothesis tested, as econometric model we use a negative binomial count model with zero inflation, ZINB.

Analyzing the characteristics of cultural consumers and the barriers of cultural participation provides significant results both for public and private sectors. On the one hand, to promote and enhance cultural participation has been concerning the public sector along decades due to the positive externalities of consuming culture. Information on the profile of the consumers and the main reasons

why they do not participate more often is useful to design efficiently future cultural policies. On the other hand, this information is also vital for private companies, helping them to provide new appealing cultural products and to develop better strategies to make them accessible for the whole public. In this regard, the demand for cinema and popular music concerts has some common patterns, but also shows some disparities.

As found repeatedly in previous literature, there is a positive effect of education on attendance. The higher the human capital, the lower the probability of being a never-goer and, within attendants, education increases the intensity of the participation. Second, we find that women are less likely to be potential consumers and attend less frequently popular music concerts than men, in line with previous findings on music consumption (Ateca-Amestoy and Prieto-Rodríguez, 2013). In contrast to Cuadrado and Frassetto (1999), we find women more prone to being never-goers to the cinema. Age affects negatively the likelihood of being a potential consumer of movies, as in Willekens and Lievens (2014), and also reduces the number of attendances.

Having children living at home reduces the intensity of cinema attendance, but the number of young children also reduces the chances of never going to movies, as in Andreasen and Belk (1980) and Ateca-Amestoy and Prieto-Rodríguez (2013). These two effects tend to offset. One possible explanation is a children-induced demand for movies, where individual's frequency of attendance is lower than if they had no children, but they try to satisfy the requests of their children.

It is more probable for individuals living in big cities to be potential consumers of cinema and, the higher the population, the greater the frequency of participation, in line with Cuadrado and Frassetto (1999), Gray (2003) or Muñoz et al. (2014). This effect is probably due to the concentration of cinemas at larger cities and capitals. This effect does not appear in concert's attendance, perhaps because cinemas tend to be located in larger cities, whereas music concerts have a wider and more dispersed supply.

The analysis of the barriers, especially on being a never-goer, can help to understand which kind of cultural policy could be more adequate to foster cultural consumption. We find that the lack of interest is the most important barrier in explaining who are the absolute zeros for both activities. Policies aimed to increase interest in culture may be more effective in reducing the probability of being a never-goer more than others tackling with other barriers, especially high prices. In fact, policies focused on subsidizing prices might polarize cultural consumption as they do not seem to be effective in attracting new consumers, but in increasing participation mainly among those who already attend.

Since the lack of interest acts as the main barrier in cinema and popular music concerts attendance, determining consumer profiles may help to design and deliver more appealing cultural products. But

also, and probably more importantly, policies would be more effective if they put their focus in increasing interest in cultural goods. As lack of interest is related to the role of tastes and preferences, long-term policies, probably implemented through the educational system, may be needed to increase cultural participation. We can also derive from our results that price oriented policies may not have the expected effects on democratizing culture unless they are accompanied by other complementary efforts towards enhancing taste formation. In fact, reducing prices would probably increase cultural consumption only among those who already participate.

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ANNEX

Table A.1

Factorial analysis of cultural equipment

Factor	Own value	Proportion of variance explained
Factor 1	2,3107	0,7611

Variables	Weights
Number of books	0,3451
Number of e-books	0,0761
Paper encyclopedias	0,2599
Electronic encyclopedias	0,1765
E-book readers	0,1091
Number of CDs	0,2992
Number of vinyl cd's	0,4242
Number of MP3s	0,1630
Number of musical instruments	0,3925
VCR	0,4047
Number of VHS readers	0,3442
Number of DVD or Blu-ray readers	0,3931
Other visual equipment	0,3132
Number of photo cameras	0,3475
Number of photo and video cameras	0,4331
Number of video cameras	0,4453
Número de smartphones with video came	0,4733
Number of VHS	0,3770
Number of DVD or Blue-ray cds	0,4321
Number of other video cds	0,1748
<i>N</i>	14.486

As it can be seen, the coefficient for the first factor is positive and, consequently, factor analysis predicts that the cultural capital is positively correlated with the variables that a priori were considered relevant. The eigenvalue of the first factor is 2.3107 and explained 71.66% of the total variance. The same applies to the factorial analysis of computer equipment, the coefficient for the first factor is also positive. Its own value is 4.3567 and 98.11 % explains the total variance. Regarding the factorial analysis of interest in reading, a positive value of the first factor is obtained. In this case the eigenvalue 2.2038 and 84.79 % explains the total variance (see Fernández-Blanco et al, 2015).

Table A.2

Factorial analysis of computer equipment and new technologies

Factor	Own value	Proportion of variance explained
Factor 1	4,3567	0,9811
Variables	Weights	
Number of computers	0,7308	
Number of computers with recorder	0,7934	
Number of multimedia cds	0,6571	
Videogame software	0,7157	
Educative software	0,6429	
Audiovisual software	0,7131	
Internet at home	0,7135	
Internet on the mobile phone	0,3241	
PDA tablet	0,3235	
Videogame hardware	0,5614	
Smartphones with internet	0,5416	
<i>N</i>	14.486	

Table A.3

Factorial analysis of interest on reading

Factor	Own value	Proportion of variance explained
Factor 1	2,2038	0,8479
Variables	Weights	
Interest on reading	0,1890	
Leisure time reading on business days	0,2810	
Leisure time reading on weekends	0,2745	
Frequency of leisure reading	0,4069	
<i>N</i>	14.486	

CHAPTER 2

RESPONSE BIAS IN OPINION POLLS: SUBJECTIVE VS. OBJECTIVE QUESTIONS¹

Abstract

In opinion polls, there are numerous sources of response bias. However, the importance of these biases depends on the type of question. The objective of this paper is to analyze the reliability of answers to survey questions concerning opinions versus questions on behavior. To do so, we take advantage of a VAT rise that took place between two waves of the *Survey on Cultural Habits and Practices* (SCHP) in Spain which produced changes in prices, price perceptions and cinema demand. After the tax change, in the survey, there were complaints about prices which are not consistent with observed consumption decisions. By comparing responses to *subjective questions (opinions)* and responses on *objective questions (behavior)* gathered before and after the tax change, we find that subjective declarations in surveys are more probably biased than objective answers about declared behavior. Responses regarding opinions about ticket prices are probably more biased because they are based on intuitive thinking. On the contrary, answers about behavior in cinema attendance involve less deliberation and fit more with reality.

1. INTRODUCTION

Through many years of research, opinion polls have been an extensively used source of information and new data. However, the utility of the data gathered through opinion polls relies on multiple characteristics of the questionnaires and the respondents. Numerous sources of response bias can be listed, some of them coming from the questionnaire itself (e.g. framing effects or default options),

¹ This chapter is co-authored with María José Pérez-Villadoniga and Juan Prieto-Rodríguez.

some others from the respondents who, intentionally or not, misreport information (e.g. adapting their answers to their interests, as in protest responses, or due to heuristics, biases and external factors). In any case, given that answers can be voluntary and/or unintentionally deviated from the truth, consumers' behavior is not necessarily in line with their survey responses, so the interpretation of survey outcomes should always be cautious.

The reliability of the data from opinion polls might be especially compromised by response biases when assessing opinions on prices. Most of the classical microeconomic models are based on the assumption that representative individuals behave rationally, maximizing their utility constrained to the available budget. Consumers are supposed to have the ability to make purchasing decisions according to well evaluated relative prices. But what happens if people are not able to *compare* prices accurately?

Since earliest research on consumers' price perceptions, it has been questioned whether individuals are able to perceive price changes (Gabor and Granger, 1961). Certainly, consumers have enormous difficulties recalling prices properly (Evanschitzky et al. 2004) and they are also limited in noticing and weighing price changes (Dickson and Sawyer, 1990). Price changes' perceptions are frequently based on feelings and general knowledge rather than on solid facts (Christandl et al., 2011). Individuals tend to be biased towards the last purchase made (Glanzer, 1972; Glanzer and Cunitz, 1966) and to evaluate prices as more expensive after recalling paying something that is not worth the money paid (Gärling and Gamble, 2006). The simple act of thinking on specific price changes makes individuals report higher inflation expectations (Bruine de Bruin et al., 2011).

In this research, we analyze responses to an opinion poll on cultural consumption conducted before and after a high and exogenous change in prices. Our aim is to analyze the effect of the price changes on the responses about their relevance on consumption and compare these responses with the declared consumption. This comparison allows examining the reliability of questions about opinions versus those questions on behavior. While answers to questions regarding opinions, are more likely to be driven by intuitive thinking, responses to questions on behavior, are straightforward and just require memory. Hence, although both types of questions may be subject to biases, these can affect differently the quality of information provided by surveys.

Particularly for this purpose, we benefit from the rise in the Value Added Tax (VAT) for cultural products that took place in 2012 in Spain, between two waves (2010-11 and 2014-15) of the Survey of Cultural Habits and Practices (SCHP). The tax rise triggered a stream of unpopularity in the mass media. In addition, the tax change was followed by several price discount campaigns launched by the supply side to offset the decline in demand, which added complexity to the evaluation of prices. As a result, in SCHP 2010-11, prices barriers were seen as important as those related with lack of time

and lack of interest. However, in SCHP 2014-15 far more people stated that prices were the main limit for cinema consumption. While individuals set their focus on prices probably due to the new tax, the price menus and the media campaign, average ticket prices slightly decreased. These events may have led to a negative opinion about prices, but observed cinema demand remained stable, in line with Wichman (2014) who found that people behave according to average prices, regardless of price perceptions.

In sum, answers to questions evaluating the importance of prices are probably *(un)intentionally* biased. Following Kahneman et al. (2011), immediate perception of prices, as being intuitive, is linked to the use of heuristics and influenced by cognitive biases. However, answers about behavior are not necessarily too much systematically deviated from truth. When making economic decisions, deliberative reflection emerges, explaining why individuals' behavior fits better the expected demand of classical economic models. Accordingly, answers about behavior are more reliable than those regarding evaluations or opinions.

The paper is structured as follows. Section 2 gives a brief overview of the literature. Section 3 focuses on the contextual framework of our analysis. Section 4 describes the methods: data base and methodology. Section 5 provides the results obtained. In Section 6 we discuss the main results and conclude.

2. LITERATURE REVIEW

The assumption of individual rationality underlies most economic models. Rationality has important implications, as in the absence of externalities, rational maximizing individuals produce efficient results for the whole society (Laibson and Zeckhauser, 1998). However, the classical theory of rational behavior is based on the expected utility theory. As exposed by Daniel Kahneman and Amos Tversky, there are numerous classes of choice problems in which preferences systematically violate the axioms of the expected utility theory. Kahneman and Tversky (1977) showed that *non-rational* behavior can be not only identified, but also predicted. Originally, they explored the heuristics² which people use in order to simplify decision-making and the typical biases people commit when using heuristics (Tversky and Kahneman, 1973; Kahneman et al, 1982). Finally, they developed an alternative paradigm to the Expected Utility Theory, namely *The Prospect Theory: An Analysis of Decision under Risk* (Kahneman and Tversky, 1979).

² Defined as mental shortcuts that usually involve focusing on one aspect of a complex problem and ignoring others in order to simplify complicated probability judgments (Lewis, 2008; Harris, 2007; Nevid, 2008).

Human behavior is often driven by multiple heuristics which can deviate individuals' behavior away from the rationality expected in theoretical models. The use of heuristics depends on the mode of thinking, which in turn is related to the type of choice. Depending on the mode of thinking, Kahneman et al. (2011) studied two different ways in which people process decisions: reflective and intuitive. The reflective mode of thinking is slower, effortful and deliberative, and requires conscious focus on the issue. This mode is habitually activated when the decision risks are high, when the decision is important or when deep reasoning is required. On the contrary, in the intuitive mode of thinking, impressions, associations, feelings, intentions and preparations for action flow naturally, allowing us to do things simultaneously without paying special attention to each action separately and without consciously focusing on how to do them. It develops a simplified understanding of reality that suppresses alternative complex options, and this can lead us astray. Most of the time, people use intuitive thinking in daily choices, using numerous heuristics to simplify decision making, but the potential inaccuracy of this type of reasoning leads to cognitive biases, i.e. imprecise ways of perceiving reality.

Answering opinion polls could be perceived as a low risk and unimportant context where intuitive reasoning may be preferred. Therefore, answers in opinion polls are often subjected to response bias (Rooij and Teppa, 2008; Bruine de Bruin et al., 2012; Caputo et al., 2018). Related to this general question, we study potential response bias in polls that included questions on price perceptions. Economists have long tried to understand the influence that price *sensations*, that is to say, the *feeling* that some product is very cheap or expensive, have on customers' decisions. Divergences between prices and the way people see them -very low or too high- often arise under conditions of price changes. Customers make choices not only according to effective daily prices, but also taking into consideration their subjective beliefs of inflation (Armantier et al., 2015). It has similarly been found that price trend perceptions are affected by expectations, even if real prices remain stable (Greitemeyer et al., 2005). What is more, perception of higher inflation is associated with negative attitudes towards inflation (Del Missier et al., 2016). In sum, several events influence peoples' perception of changes in prices, such as experiences of previous price changes, expectations on inflation, social amplification of price changes and personal and social attitudes towards inflation (Ranyard et al., 2008).

In what follows, we review the literature about the different sources of intentional and unwilling divergences from truth in opinion polls' responses.

2.1 The effect of simplifying: the use of intuitive thinking

If individuals are ruled by intuitive thinking when evaluating prices, their declarations will be probably influenced by several biases. In our case, the anchoring bias, conservatism bias, recency effect, bandwagon effect and illusory truth effect, discussed below, seem to be the most relevant ones.

Anchoring bias (Tversky and Kahnemann, 1974) explains that people solve problems by setting a starting point and then adjusting from it to generate the final decision. There is a human tendency to anchor first-sight information, and once the anchor is set, the remaining judgments are made by adjusting away from that anchor. Additional information around the anchor is usually inaccurately evaluated, which results in insufficient adjustments, so answers are biased toward the starting point (Laibson and Zeckhauser, 1998). This links with conservatism bias (Edwards, 1968), in which individuals over-weight prior information and under-weight the new evidence when revising their beliefs. Additionally, the serial-position effect (Zechmeister and Curt, 1984; Ebbinghaus, 1913; Gershberg and Shimamura, 1994) refers to the fact that recall accuracy varies considering order position. Specifically, the recency effect (Deese and Kaufman, 1957; Murdock, 1962; Baddeley and Hitch, 1993), describes how individuals tend to recall better the last items on a list.

The bandwagon effect refers to a phenomenon in which the rate of approval of some belief increases as it is already accepted by others, so that the probability of individual adoption increases with the proportion who have already done so (Colman, 2003). As a result, some individual choices have their roots in information gathered by others. Such behavior explains why some people ignore their personal preferences and adopt other people's ones, so that individual preference for a product increases as its purchases rise (Leibenstein, 1950). Similarly, the illusory truth effect is the general tendency to believe information to be true when stated repeatedly (Lynn et al., 1977).

Other important fact is when price changes come from a rise in taxation. People dislike paying taxes. Tax aversion behavior could imply even making choices that reduce overall individual's wealth with the only purpose of reduce tax payments (Blaufuss and Möhlman, 2014), and that individuals show a stronger preference to avoid tax-related costs than equal costs not related with taxation (Sussman and Olivola, 2011). Besides that, mass media campaigns against tax rises in the news have a strong effect given that mass media tend to pay special attention to bad economic news (Goidel and Langley, 1995). In addition, price sensitivity is higher for price changes above the price of reference (Caputo et al., 2018). People taking as reference standard prices before the tax change and comparing them to prices after changes, not considering discounts, would react *more* adversely. Additionally, media and word of mouth also affect peoples' price perceptions (Ranyard et al., 2008).

2.2 What I think vs. what I say: response bias

Opinion polls' responses often contain some specific biases since surveys are not conducted in a vacuum, as suggested by Caputo et al. (2018). One source of unintentional deviation from truth in surveys' responses is the inaccuracy of memory. People are supposed to be able to recall prices basing on previous experiences or knowledge. However, this recall is imprecise both because of the limited capacity of memory storage and the complexity of price ticket tariffs. Reported information is also affected by satisfaction level, as in hedonic recall bias (Prati, 2017), so dissatisfaction with current pricing could lead to over-estimate prices. Simply the mood of the respondent, as in affect heuristic (Finucane et al., 2000), can deviate responses both upwards or downwards. Even depending on the wealth of the consumer, price recalling is substantively affected, as in Petar and Mirjana (2013). Other source affecting price responses are the heuristics used. For instance, availability heuristic (Carroll, 1978) and associativeness, describing that individuals could relate the price rise to their previous experiences of inflation or to recent economic turbulences. Another source of divergence between truth and responses are systematic deviations. As noted by Bruine de Bruin et al. (2012), simply question wording produces relevant biases on consumer's reported inflation expectations. There is also an important attractiveness in default options (Rooij and Teppa, 2008) this is, to choose options just because they are already selected by default, as in organ donation (Davidai et al. 2012) or electricity products (Kaenzig et al. 2013). In addition, individuals have the tendency to take the path of least resistance (see, for example, Baker et al. (2007)).

On the other hand, results could be intentionally altered in order to adjust towards social desirability (see, for example, Brenner (2011a, 2012), Shepard (2003)) exaggerating positive behaviors and downplaying negative ones to manage the impression caused on others. In this sense, even respondent's perception of the interviewer could define the bias of their response (Brenner, 2017). In stated preferences methods, consequentiality is found to positively affect voting as being essential for incentive compatibility (Vossler and Watson, 2013). Affective and moral considerations do have influence too, in some cases materializing in protest responses (e.g. in contingent valuation, Sawe (2017)). In fact, taxes cause an especially high number of protest responses (Meyerhoff and Liebe, 2010).

3. CASE OF STUDY

In order to bring light on the effect of price changes on price perceptions, how cognitive biases affect these judgments, and their impact on individuals' behavior, we focus on cinema participation in Spain. Between the two Surveys of Cultural Habits and Practices (SCHP) conducted in periods 2010-11 and

2014-15, in 2012, the VAT for cultural products rose from 8 percent to 21 percent. This VAT increase generated a huge mass media coverage and public attention, although it would lead to effective increase in the standard price lower than 1€ per ticket. Besides that, cinema consumption is complementary to other activities. All expenses considered, the total effect of the tax change on the price of the whole activity of *going to the cinema* would be even lower.

Due to this fiscal adjustment, the main reason why individuals declared they did not attend more frequently to the cinema in the second period of the survey was mostly price. At first sight, given that the Cultural VAT increased, declaring prices as the central problem for participation might seem reasonable. However, the average price of cinema tickets has been steadily falling since 2010 so, after the change, individuals managed to pay, on average, less than before. Indeed, effective cinema demand was recovered by 2015, being cinema attendance almost stable (1.10 times each 3 months in 2010-11, 1.09 times in 2014-15).

The reduction in average prices paid is only explainable through the number of customers who benefited from price reductions. In the years following 2012, exhibitors and distributors implemented price discrimination policies to cope with the new taxes and the successive drop in attendance.³ In order to evade the new regular price, cinema consumers engaged in a *time-consuming* search of price reductions, since discounts often require planning in advance (purchase, download and print a coupon from the Internet, to register in some platform...).

All in all, the increase in regular ticket prices combined with the new price menu led cinema fans to devote time searching discounts that fit in their preferences. Nevertheless, this *hunt for bargains* entails being excessively conscious of the high regular ticket prices, which could have been one driver of the concern about them, even in a context where average prices fell.

4. MATERIALS AND METHODS

4.1 Data base

The database chosen is the Survey of Cultural Habits and Practices (SCHP) conducted by the Education and Culture Ministry of Spain, which covers the most relevant areas of cultural consumption, such as cinema, concerts, theatre or museums. We use two successive waves from

³ In fact, the initial impact of the Cultural VAT increase was in terms of participation. Although attendance had parsimoniously fallen since 2010, it suffered a sharp decrease between 2012 and 2013, that was mostly recovered by 2015.

periods 2010-2011 and 2014-2015. During both periods, in each trimester of the 2 years, a random population sample was interviewed, which resulted in a total of 14,486 and 15,154 respondents, respectively. The final sample is representative of the Spanish population in terms of education level, employment status, family responsibilities and region of residence. This database is the most suitable for our purpose as it includes information regarding participation and intensity of cinema consumption.

Individuals were asked how many times they had attended the cinema within the last three months, as well as which was the main reason why they had not attended more frequently. From the choice set, individuals could select prices⁴. Choosing this category might be motivated by different reasons. It is true that referring to high prices may sound more convincing to the interviewees, or that other categories sound even less plausible to them. Nonetheless, as mentioned before, the proportion of people declaring prices more than doubled between waves, at the expense of lack of time and interest alternatives. Given that declared interest on cinema, time availability and economic resources barely changed between 2010 and 2015, pointing price as the main reason for not attending cinema more frequently is not just a question of mere plausibility. Accordingly, we understand that declaring price is an appropriate proxy for individuals' *feelings* about cinema ticket prices. An inflated price perception is the most likely reason to explain the large change in the proportion of people declaring prices as the main problem for cinema attendance.

Table 1 presents the summary of descriptive statistics of the two samples. It can be observed that the socioeconomic characteristics remained almost the same. It is noteworthy a slight decrease in the average age and that individuals in the second sample have a higher educational level.

⁴ All possible answers are: (1) price, (2) it is difficult to get tickets, (3) scarcity of supply, (4) little information, (5) preference for television, (6) video or the internet, (7) difficult to understand, (8) lack of time, (9) lack of interest, (10) lack of company.

Table 1. Descriptive statistics

Variables	2010-11 (1)	2014-15 (2)
Male	0.48 (0.500)	0.49 (0.500)
Age	52.22 (19.102)	49.14 (18.827)
Primary education or less	0.25 (0.432)	0.18 (0.388)
Secondary education	0.45 (0.497)	0.47 (0.499)
Vocational training	0.14 (0.342)	0.15 (0.356)
University	0.17 (0.376)	0.19 (0.395)
Employed	0.45 (0.498)	0.45 (0.497)
Unemployed	0.13 (0.331)	0.14 (0.350)
Retired	0.20 (0.399)	0.21 (0.406)
Disabled	0.01 (0.078)	0.01 (0.093)
Student	0.09 (0.292)	0.09 (0.290)
Housework	0.12 (0.322)	0.09 (0.288)
Other employment status	0.01 (0.091)	0.01 (0.091)
# Family members	3.12 (1.340)	3.06 (1.354)
Living with parents	0.21 (0.406)	0.19 (0.394)
No children on charge	0.47 (0.499)	0.48 (0.499)
# Children 10-14	0.34 (0.713)	0.35 (0.729)
# Children < 10	0.24 (0.592)	0.25 (0.607)

Note: standard deviation in parentheses

4.2 Methods

To perform our empirical analysis, we estimate a model divided into two stages. In the first stage, two probit models are estimated in order to analyze the probability of declaring price as the main constraint for cinema participation, for the two SCHP waves. In the second stage, a zero inflated negative binomial model (ZINB) is estimated to analyze cinema attendance, pooling both samples, and controlling for the changes in price perceptions forecasted in the first stage. The analysis is implemented as follows.

4.2.1 First stage: analyzing differences in price problems declarations

To analyze the differences between the probability of declaring price as the reason for not attending more to the cinema in 2010-11 and 2014-15, we estimate two probit models:

$$\Pr(\text{Price Declaration}_t) = f(\text{Csoc}_t, \text{Clab}_t, \text{Cedu}_t, \text{Cgeo}_t, \text{i}_{\text{cine}_t}, \text{PriceOthers}_t) \quad (1)$$

Where t represents both samples and our dependent variable, $\Pr(\text{Price Perception}_t)$, takes value 1 if the individual declared price as the main reason why he did not attend to the cinema more often in period t , and 0 otherwise. The underlying assumption is that it captures people's opinion on cinema prices. It is assumed to depend on the following independent variables.

First, Csoc includes gender, age and its square allowing us to account for its possible non-linear effect. Concerning household features, we consider the number of members who live at home (*# Family members*), whether the individuals are still living with their family (*Living with parents*), individuals not in charge of children (*No children on charge*), individuals in charge of children between 10 and 14 (*# Children 10-14*) and individuals in charge of children under 10 (*# Children <10*), *other family situations* as reference category. Clab includes dummies for labor status: *Employed, Unemployed, Retired, Disabled, Student, Housework* and other situations as the reference category. Cedu , comprises dummy variables regarding education levels including *Secondary education, Vocational training, University* being *Primary education or lower* the reference category. Cgeo stands for geographical control variables, including a set regional dummies and a group of city size controls.

In order to enhance the predictive capacity of the model, we take advantage of price perceptions regarding other cultural activities. Thus, we include *Price Others*, that capture declarations of price as the main reason for not attending more often theatre, popular music and classic music concerts, altogether. Lastly, i_{cine} is the individual's self-declared interest on cinema, in a scale from 10 (great interest) to 0 (not interested at all).

After the estimation of the probit models, we get predictions of the probability of declaring price as the main problem for each wave. By evaluating 2010-11 and 2014-15 predictions, we can compare changes in price *feelings* between the pre and post VAT scenarios. This allows us to identify the effect that the VAT increase, the implementation of price promotion policies and other events that took place between the two surveys, had upon consumers' subjective opinion of the price as the main problem for cinema attendance.

4.2.2 Second stage: analyzing differences in cinema attendance

In the second stage, we study the effects that changes in price valuations, measured as the difference between predictions obtained in the first stage, might have had on cinema participation. In order to do so, we estimate a demand model pooling both SCHK samples.

As it is common in cultural participation, the data is characterized by over-dispersion and excess of zeros (around 50 percent of the sample declared not having attended cinema in the last term) due to the unobserved heterogeneity of individuals' preferences. Following Ateca-Amestoy and Prieto-Rodríguez (2013) and bearing in mind the suitability of the estimation method with respect to the behavioral assumptions of cultural participation, we use a zero-inflated negative binomial model (ZINB). Furthermore, we use likelihood ratio tests (LR tests for nested models) and Bayesian information criteria (Akaike and BIC statistics for non-nested models) to assess the appropriateness of our specification.

In ZINB models, an individual first makes the binary decision of whether to participate or not and then, after deciding to participate, optimally determines the intensity of participation, in other words, the number of attendances. This implies that zero observations could belong to two different subpopulations: potential consumers, i.e. those who did not attend but could have attended under other circumstances and never goers, i.e. those who did not attend, and would not do so in any case. Consequently, this model contemplates the fact that variation in price perceptions may affect differently effective and potential consumers, in contrast to never-goers. For example, alterations in taxes and price promotions might lead effective and potential consumers, to adjust their intensity of consumption, while never-goers might vary their probability to stay as non-attendants or to start participating.

Therefore, this model allows us to separate two different data-generating processes. One determines the probability of attending a positive number of times whereas the other describes the probability of being a never-goer, considering that some zeros have a non-zero probability of being attendants. Belonging to either group is determined by a latent binary process and the behavior of the zeros and of the positive counts is ruled by a negative binomial process. The first process, the zero-inflation regression, estimates the effect that each covariate has on the probability of being a never-goer, i.e. it explains the decision of whether or not to participate. The second process, the count regression, estimates the effect of each explanatory variable on the probability of showing a positive number of attendances, in other words, it explains the intensity of participation.

Following the standard specification in the literature, individuals' socioeconomic characteristics are the main determinants of cultural participation in general (Fernandez-Blanco et al., 2009; Falk and Katz-Gerro, 2016; Willekens and Lievens, 2016; Ateca-Amestoy and Prieto-Rodríguez, 2013) and, specifically, of cinema attendance (Fernandez-Blanco and Baños, 1997; Sisto and Zanola, 2010).⁵

⁵ Films' characteristics and releasing conditions are also relevant to explain movie demand (Gutierrez-Navratil et al., 2014) but we are concerned about the determinants of the cinema demand, as a whole, and not about a particular film.

Consequently, we specify a model where the dependent variable is the number of times the individual went to the cinema in the last term, *Cinema Attendances*, which depends on the following:

$$\begin{aligned} & \text{Cinema Attendances} \\ & = f (\text{Csoc, Clab, Cedu, Cgeo, Equipment, Reading, Predicted } I_{\text{Cine}}, \text{Price Declaration}_{2011}, \text{Declaration Change}) \end{aligned} \quad (2)$$

where *Csoc*, *Clab*, *Cedu* and *Cgeo* are socioeconomic features, educational level, labor status, and geographical controls, respectively. All of them are defined as in the first stage. Consumption of cultural goods is usually positively related to income (Prieto-Rodriguez et al., 2005) but, unfortunately, we lack household or individual earnings. To overcome this absence and following Fernandez-Blanco and Prieto-Rodriguez (2009) two independent Principal Component Analysis (PCA) were conducted in order to proxy cultural equipment (*Equipment*). We consider that the quantity of cultural equipment is highly correlated with household income and also with the propensity to spend such earnings on cultural activities. So, we conducted a first PCA with variables such as TV, DVDs, number of music albums, video player, camera, or video camera and another for informatics equipment, such as computer, tablet or access to the internet, in order to complement physical cultural capital. Moreover, a third PCA was carried out gathering variables related with reading habits (*Reading*), given that preferences for reading are strongly related with cultural interests in general (Fernandez-Blanco et al., 2017).

Then, *Predicted I_{Cine}* are the predictions obtained from an auxiliary regression where the interest in cinema (*I_{Cine}*) variable included in probit estimations is explained by individual's interest in other cultural activities (see Annex). This variable is included to control for the effect that the variable *interest in cinema*, which is positively correlated with the frequency of cinema attendance. Since we are interested in the role of price perceptions and how they did change from 2010-11 to 2014-15, we have included forecasted variables concerning price perceptions derived from the first stage. On the one hand, using the coefficients obtained from the estimation of the probit model with data from the 2010-11 sample, we forecast for both samples the probability of declaring prices as the main reason of non-attendance, *Price Declaration₂₀₁₁* (forecasted price declaration for 2011). This variable measures price perceptions if the scenario of 2010-11 (before VAT rise, the mass media campaign and other price policies) had remained stable, capturing individuals' *baseline* propensity to declare price as the main reason why not to attend to the cinema more regularly. On the other hand, we calculate another variable, *Declaration Change* (price declaration change). For individuals in the 2014-15 sample, this variable is defined as the difference between the predictions coming from both probits (2014-15 minus 2010-11 predictions), being 0 for individuals in the 2010-11 sample. Thus, this variable allows us to proxy the differential effect of the VAT rise, the mass media campaign as well as of any other change

that affected cinema prices and their perceptions. In other words, it captures the differences between the 2010-11 and 2014-15 scenarios.

5. RESULTS

Since we cannot observe cognitive biases regarding prices, we have to rely on the self-declared relevance of prices as a limit for cinema attendance. Given that average prices slightly decreased between the analyzed periods, we would expect a similar proportion of individuals declaring prices as their main reason for not attending cinema more. However, the number of people declaring prices more than doubled in 2014-15. The main objective of this section is to analyze which socioeconomic characteristics define individuals with larger changes in their declarations who, therefore, show a greater signal of being affected by other effects apart from average prices.

Before proceeding with this analysis, we need to test whether the differences in the replies between the two waves are not due to distinct features of the people surveyed in both waves. Consequently, we calculate the nearest neighbor matching estimator (Abadie and Imbens, 2002), which allows comparing price perceptions by matching individuals who are similar in both samples. Thus, any significant variation in this variable could not be attributed to the sampling.⁶ We find that, once we control for the characteristics of the respondents, the likelihood of declaring price as the main reason for not attending more frequently to the cinema is 22.5 points higher in 2014-15 than in 2010-11, with a standard deviation of 0.6. Therefore, most of the observable differences in price perceptions between the two periods are attributable to changes in contextual factors but not to sampling.

5.1 Changes in price declarations over time

Given that the average price of cinema was lower by the time of the second wave of the SCHP, any increase in the average declaration of price as the main attendance restriction would point to the existence of external factors influencing evaluations of prices apart from the real average ticket prices. In order to analyze differences in price valuations, we estimate one probit model for each period, 2010-11 and 2014-15. Results are displayed in Table 2.

The main results comparing the coefficients of both probits can be summarized as follows. First, while, as in Del Missier et al. (2016), there is no gender effect in 2010-11, in 2014-15 men are more likely to declare price as the main constraint for cinema participation. Second, in 2010-11 the effect of age

⁶ We define the matching estimator requesting an exact match for gender, educational level, being employed, unemployed or retired. Matching over age, household members, cinema interest, price declaration propensity, civil status, disabled, housework and geographical variables, was done using the nearest neighbor matching.

is negative and linear, whereas in 2014-15 it is quadratic. Third, in line with Oechssler et al. (2009), in both periods, it is less likely that highly educated individuals declare price constraints since they tend to present lower biases. Also, they usually have higher incomes, being other restrictions more relevant.⁷ Fourth, as expected, unemployed individuals are more prone to declare price in both periods. Additionally, in 2014-15 students declare price too. Since benefiting from promotions requires making the decision in advance (they are not applicable instantaneously), they are constantly aware of prices. The search of discounts can be considered a collateral unpleasant effect of promotions, thus it could be overestimated as pointed by Casey and Owen (2013). Fifth, the larger the family the lower the propensity to declare price barriers, although household size is only significant in the second period. Sixth, given that living with children generates cinema demand, it is interesting to distinguish households with children under 10 and between 10 and 14 years old. For the first group, probably the main restriction is related to time availability rather than prices, while for families with children between 10 and 14, as time restrictions become less relevant, prices start to play a more important role. Seventh, both *interest in cinema* and *price sensitivity*, present a positive effect that is larger in 2014-15. Finally, none of the PCA shows a significant coefficient, either separately or together. This result is coherent as individuals' perceptions do not depend on physical capital.

Table 2. Probit estimations

	2010-2011 (1)	2014-2015 (2)
Man	-0.007 (0.026)	0.049** (0.025)
Age	-0.019*** (0.005)	0.004 (0.005)
Sq Age	-0.004 (0.005)	-0.026*** (0.005)
Secondary education	0.071* (0.037)	0.048 (0.035)
Vocational training	0.045 (0.048)	0.123*** (0.045)
University	-0.133*** (0.049)	-0.082* (0.043)
Employed	-0.0628 (0.135)	0.084 (0.129)
Unemployed	0.256* (0.137)	0.428*** (0.131)
Retired	0.108 (0.142)	0.096 (0.133)
Disabled	0.116 (0.210)	-0.227 (0.177)
Student	0.037 (0.142)	0.376*** (0.138)

⁷ Also, as the price change is associated to a rise in the VAT, this result could be linked to individuals' moral tax, which in turn depends on education (Rodriguez-Justicia and Theilen, 2017).

Housework	-0.018 (0.141)	0.141 (0.134)
# Family members	0.008 (0.011)	-0.026** (0.011)
No children on charge	-0.011 (0.034)	0.007 (0.032)
# Children 10-14	0.111*** (0.037)	0.072** (0.036)
# Children <10	-0.267*** (0.041)	-0.170*** (0.039)
Interest in Cinema	0.047*** (0.005)	0.054*** (0.005)
Price sensitivity	0.227*** (0.008)	0.253*** (0.006)
PCA Cultural equipment	-0.002 (0.024)	-0.011 (0.022)
Sq PCA Cultural equipment	-0.006 (0.006)	0.006 (0.005)
PCA Physical cultural capital	0.009 (0.020)	-0.009 (0.017)
Sq PCA Physical cultural capital	-0.025 (0.017)	0.006 (0.015)
PCA Interest in reading	0.027 (0.018)	0.010 (0.015)
Sq PCA Interest in reading	0.002 (0.006)	-0.005 (0.005)
Constant	-0.493** (0.210)	-0.455** (0.180)
Regional Dummies	YES	YES
<i>N</i>	14486	15154
<i>LR (41)</i>	3030.00	5089.27
<i>AIC</i>	14083.46	15748.94
<i>BIC</i>	14401.86	16069.24

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

It is interesting to assess the extent to which the changes between periods affected groups of individuals differently. To analyze this issue, we forecast, for all individuals in each sample separately, their probabilities of reporting price as the main reason for non-attendance. In Table 3, we display the average increase in the predictions from 2014-15 to 2010-11, conditional on belonging to each category.⁸ Since all values are positive, regardless of gender, age or educational level, all groups

⁸ Additionally, we run a bootstrap analysis to assess whether a particular individual's characteristic, independently of others, is linked to changes in the reported probability of declaring prices as the main reason for not attending to the cinema more often. That is to say, if the observed changes in declarations fulfill the ceteris paribus condition. Effectively, bootstrap analysis is consistent with our previous results. Bootstrap results are disposable upon request.

show in 2014-15 a higher probability of stating price as the main restriction in comparison to what they would have declared in 2010-11⁹.

Table 3. Predicted change in the self-declared price constraint

Educ level	Woman	Man	Age group	Woman	Man
Primary	12.7%	15.0%	Under 25	14.4%	16.8%
Secondary	16.9%	18.6%	25-44	19.9%	22.2%
Vocational	21.0%	22.8%	45-64	20.5%	21.8%
University	20.3%	21.8%	Over 64	10.9%	11.5%
Total	17.4%	19.2%	Total	17.4%	19.2%

Regarding gender, in 2014-15 the increase in the probability of declaring price is higher for males than for females, suggesting that males are more influenced by external factors regarding prices. Education presents decreasing increments on the price perception change for both genders, with a decline at the upper level. In line with these results, age groups display an inverted U-shaped effect, since the youngest and the oldest present lower education levels. Furthermore, the lowest increase associated with people over 64 also responds to their low cinema demand.

5.2 Cinema participation

Since cinema demand is price elastic (Dewenter and Westermann (2005), Roos and McKenzie (2014), Fernandez-Blanco et al. (2013)), if behavior were ruled by the declared price, we should have observed a fall in cinema demand. But in spite of the important increase in the concern about prices, cinema participation remained almost stable. In this context of stable average demand with average prices declining, the issue why price declarations increased still remains. For some people, the price could persist as the main problem for cinema attendance. Their answers could be considered our reference level. However, for others, the presence of external factors affecting price evaluations when answering surveys could explain the rise in price declarations. The distinction between these two groups of individuals might rely on the observed differences in their price declarations between periods.

In order to distinguish this differential effect, we employ a ZINB model. On the one hand, the count equation explains the probability of higher counts among attendees. On the other hand, the inflation equation determines the probability of an individual being a never-goer. The two equations cannot be specified separately, as the high significance of the alpha coefficient indicates. To identify the effect of price perceptions on cinema demand, we estimate two different specifications of the ZINB model. In Model A, we explain cinema participation without considering price perceptions, being this our

⁹ According to t-tests, differences among groups are statistically significant.

baseline model. In Model B, we add price perceptions and their changes: *Price Declaration*₂₀₁₁ is defined, for the whole sample, as the predictions of the 2010-11 probit and *Declaration Change* is measured, for individuals surveyed in 2014-15, as the difference between the predictions from the probits estimated for both periods, and 0 otherwise. As Model A is nested by Model B, if the effect of these two variables is significant, Model B will be considered as our reference. Using the AIC and BIC information criteria, Model B is statistically preferred. Results are reported in Table 4.

Columns (1) and (3) display the count equation coefficients, i.e. the equation determining the probability of attending a positive number of times, whereas columns (2) and (4) show inflation equation coefficients, i.e. the equation determining the probability being a non-goer. Positive coefficients in the inflation equation indicate a higher probability of belonging to the certain zero attendance group.

According to results in columns (3) and (4), coefficients on *Price Declaration*₂₀₁₁ imply that the more the awareness about prices as a restriction to attending cinema, the higher the likelihood to be a cinema goer. First, due to the significant negative coefficient on the inflation equation in column (4), it is less likely that these individuals do not attend at all. Second, as the positive and statistically significant coefficient in column (3) shows, if they decide to attend, they will do it more regularly than those who bear in mind other restrictions on attendance. Therefore, certain non-goers and low demand individuals are characterized by a higher probability of declaring other reasons than price as their limit for participating. The negative and significant coefficient of *Declaration Change* in the inflation equation, in column (4), indicates that increases in price declarations led to a drop in the probability of never attending cinema.

The remaining considered variables are included as controls to ensure that the effects of price perceptions are consistently estimated. In general, these controls present the expected results. Starting with sociodemographic features, age has a negative effect since older individuals are more likely to be non-goers. Moreover, the older people are the lower their frequency of participation. According to the fact that cultural participation is typically higher for women (Ateca-Amestoy, 2008), the probability of being a certain non-attendant is higher for men. However, if they decide to attend, men participate more frequently than women. Concerning educational level, in line with Ateca-Amestoy and Prieto-Rodriguez (2013), the higher the qualification the greater the likelihood to be a cinema spectator and the greater the degree of participation. With respect to labor status, as in Falk and Katz-Gerro (2016), unemployed individuals show a higher probability of being non-attendants. On the contrary, students have more chances to participate. Both employed and retired individuals have a higher rate of cinema attendance. Regarding household features, larger families have a higher probability of belonging to the certain zero group. Individuals living with their parents and people

without children display a higher level of attendance. In contrast, individuals with children between 10 and 14 have less chances to participate, and those with children under 10 attend less regularly. As pointed out by Fernandez-Blanco et al. (2017), reading is positively related to the likelihood of going to the cinema. Concerning cultural equipment and physical cultural capital, in line with Sisto and Zanola (2010), both are negatively related to the probability of being a never-goer. Accordingly, cultural equipment affects cinema participation positively.

Table 4. ZINB estimations

	Model A		Model B	
	Count (1)	Inflation (2)	Count (3)	Inflation (4)
Year 2014	-0.193*** (0.030)	-0.394*** (0.065)	-0.307*** (0.061)	0.275** (0.127)
Man	0.035 (0.026)	-0.180*** (0.065)	0.047* (0.026)	-0.189*** (0.066)
Age	-0.018** (0.007)	0.035** (0.016)	-0.020*** (0.007)	0.034** (0.016)
Sq Age	0.025*** (0.007)	0.022* (0.013)	0.029*** (0.008)	0.012 (0.013)
Secondary education	0.163*** (0.057)	-0.464*** (0.088)	0.151*** (0.057)	-0.456*** (0.088)
Vocational training	0.162** (0.065)	-0.940*** (0.120)	0.148** (0.065)	-0.884*** (0.121)
University	0.282*** (0.062)	-1.565*** (0.115)	0.302*** (0.062)	-1.607*** (0.117)
Employed	0.225* (0.131)	0.140 (0.428)	0.251* (0.134)	0.239 (0.454)
Unemployed	0.116 (0.134)	0.654 (0.432)	0.079 (0.137)	0.979** (0.461)
Retired	0.277* (0.145)	0.259 (0.433)	0.290** (0.148)	0.370 (0.460)
Disabled	0.157 (0.269)	1.005* (0.579)	0.199 (0.275)	0.878 (0.612)
Student	0.108 (0.135)	-1.776** (0.795)	0.096 (0.139)	-1.376* (0.712)
Housework	0.057 (0.148)	0.337 (0.434)	0.080 (0.151)	0.488 (0.461)
# Family members	-0.023* (0.013)	0.096*** (0.029)	-0.021 (0.013)	0.095*** (0.029)
Living with parents	0.344*** (0.063)	-0.134 (0.169)	0.327*** (0.062)	-0.197 (0.170)
No children on charge	0.127*** (0.047)	0.126 (0.089)	0.119** (0.046)	0.112 (0.089)
# Children 10-14	0.037 (0.045)	-0.167* (0.097)	0.022 (0.046)	-0.165* (0.098)
# Children <10	-0.218***	0.019	-0.180***	-0.030

	(0.047)	(0.114)	(0.048)	(0.114)
PCA Cultural equipment	0.034*	-0.065	0.033*	-0.095**
	(0.018)	(0.042)	(0.018)	(0.043)
Sq PCA Cultural equipment	0.021	-0.014	0.021	-0.013
	(0.016)	(0.039)	(0.016)	(0.040)
PCA Physical cultural capital	0.013	-0.132**	0.012	-0.164***
	(0.021)	(0.053)	(0.021)	(0.054)
Sq PCA Physical cultural capital	0.003	0.006	0.003	0.011**
	(0.002)	(0.007)	(0.002)	(0.006)
PCA Interest in reading	0.012	-0.097**	0.009	-0.094**
	(0.017)	(0.040)	(0.016)	(0.039)
Sq PCA Interest in reading	0.007*	0.008	0.007**	0.008
	(0.004)	(0.014)	(0.004)	(0.009)
Predicted Interest in cinema	0.113***	-0.412***	0.104***	-0.369***
	(0.011)	(0.021)	(0.011)	(0.021)
Price Declaration 2011			0.392***	-1.507***
			(0.093)	(0.258)
Declaration Change			0.319	-3.104***
			(0.269)	(0.616)
Constant	-0.455*	1.168*	-0.488**	1.303*
	(0.242)	(0.676)	(0.247)	(0.693)
Regional Dummies	YES	YES	YES	YES
Observations		29,640		29,640
Alpha		1.139***		1.130***
		(0.037)		(0.037)
AIC		70688.45		70515.05
BIC		71460.06		71319.85

To sum up, we find that increases in price declarations led to a drop in the probability of never attending cinema, which suggests that effects regarding serial position might underlie most of the changes in price declarations. The fact that people declaring prices tend to be goers, makes also more likely for them to be affected by search costs.

We also find that the higher the education, the lower the probability of changing price perceptions. This could be explained by the role of mass media depending on education levels. On the one hand, low educated people have a higher demand for entertainment relative to that for information in the media and, consequently, were less exposed to mass media campaign on the VAT rise. On the other hand, more educated people, although more exposed to mass media, could disclose their messages easier and, thus, had a slightly lower increase in the price declaration (see, for instance, Oechssler et al., 2009, and Jackson et al., 2016).

Certain non-goers and low demand individuals are characterized by a higher probability of having other reasons than price as the limit for participating. One interpretation for this result is that movie

aficionados may be aware of the standard ticket prices and declared them (instead of average prices) the main restriction to attend more often. For this public, it is likely that time or interest constraints are not so relevant since they already have a high demand. Another possibility, as pointed by Christandl et al. (2011) and Armantier et al. (2015), is that movie fans already knew about the VAT rise and interpret price changes according to their expectations (as in confirmation bias, defined by Nickerson, 1998). As never-goers do not have price knowledge based on their own experience, if they declared prices as the limit, they would be influenced by other channels, such as mass media (Del Missier et al., 2016), or others' judgments (Gärling and Gamble, 2006). In line with Bruine de Bruin et al. (2011), high demand consumers who tend to be well informed, are also more likely to be affected by the recency effect. For those non-goers declaring prices, declarations would be based on "hearsay" evidence and, thus, on information from publicly observable statements of other people (Meub and Proeger, 2015).

7. CONCLUSIONS

In opinion polls, biased responses may appear due to numerous reasons. However, the bias is not equally important depending on the type of question. In this paper, we take advantage of a normative change that took place between the last two waves of the SCHP in Spain to analyze the reliability of the answers to survey questions about opinions versus questions on behavior.

In 2012, the VAT for cultural products changed, increasing standard cinema ticket prices. This tax rise generated, first, a negative mass media campaign that amplified public awareness and raised discontent among cultural agents. Second, following the VAT rise, several price differentiation policies were implemented by the supply side, altering the price menu. These price policies more than compensated the initial price increase, resulting in a *slight* decline in average prices. Despite this small drop in the average ticket price, in the survey from 2014-15, there were disproportionate declarations of prices as the main reason why not to attend cinema more frequently, while in 2010-11 prices were not seen as a major constraint to participation. This inconsistency in answers to the limits of cultural participation could be a signal of biases in survey responses regarding opinions. Accordingly, one might expect response biases also in individuals' declarations about their behavior. However, responses to the frequency of cinema attendance remained stable, according to the *relative* stability of average prices. It seems that people had the *feeling* that prices increased, thus they pointed prices as the biggest problem for attending cinema, which is a question about their *subjective* opinion. Nevertheless, people behaved according to average prices, and so did their declarations about their frequency of participation, which is a question about their *objective* behavior.

Answers to *subjective* questions and opinions, like *which is the main barrier for cinema participation*, are probably driven by intuitive thinking, providing the perfect conditions for the use of heuristics and shortcuts. On the contrary, responses to *objective* questions on real behavior, like *how often have you attended the cinema during the last three months*, are straightforward and do not require reflection. As a result, we find questions regarding opinions more subject to response bias than those related to real behavior.

Numerous reasons could be pointed as explanations to the bias that led to the high increase in the declaration of prices as the main limit for cinema participation in the wave of 2014-15 of the SCHP. First, tax rises tend to be very unpopular, and associated price increases are perceived larger than they actually are (Blaufusand and Möhlmann, 2014). Since the source of the price change was a VAT increase, it could have generated an important number of protest responses (Meyerhoff and Liebe, 2010). In fact, it is known that people dislike paying taxes more than any other equivalent cost (Sussman and Olivola, 2011). In addition, the exaggerated impact of the tax in the media could have deviated individual responses towards the general public opinion. People tend to believe information stated repeatedly and individuals probably *anchored* the impression of 'expensiveness' since it was the fastest impression to recall. Beyond that, the inconvenience of searching discounts makes it easier to recall prices excluding reductions. Although individuals might benefit from promotions, being eligible could be time-consuming and it often implies attending at the least appealing sessions. Therefore, individuals might have taken prices without discounts instead of average prices as reference when giving their opinion on the main limit for participation.

But, regardless of price perceptions and tariffs, people's answers regarding behavior match with average prices, in line with Wichman (2014). Several reasons may underlie the fact that average cinema demand remained stable. First, individuals tend to be myopic, and price changes often have a bigger impact in the short term, but demand tends to recover over time. Second, as the VAT of complementary activities (such as transport costs, parking, pop-corn and restaurant) remained stable, the effect of the tax rise in monetary terms was quite small on the whole activity. Third, the set of new promotions let people adapt their demand to the new trade-off between prices and time slots, resulting in an overall stable demand. Fourth, when making economic decisions, reflective thinking gets involved, which explains why individual's behavior is more rational and in line with real average prices instead of *feelings* about expensiveness. Fifth, price discrimination policies affected the rate of attendance of some moviegoers as well as the likelihood of participating of others. Since demand remained constant, changes in the composition of attendants tended to cancel out. Consequently, on average, economic behavior was barely affected by biases. As average prices remained stable, both real and declared attendance fit on the behavior that standard rational economic theories would forecast.

To sum up, when using information from opinion polls, researchers should be aware that answers regarding subjective opinions tend to be instinctive and may be subject to numerous response bias. Therefore, these responses are less reliable than those relative to behavior, which involve less reflective thinking and are, consequently, less subject to biases.

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ANNEX

Table ANNEX. OLS Interest in cinema

Variables	Coef. (sd)
Year 2014	0.187*** (0.024)
Man	0.130*** (0.025)
Age	-0.044*** (0.005)
Age (Square)	0.019*** (0.004)
# Family members	-0.020** (0.010)
Living with parents	-0.037 (0.053)
No children on charge	-0.129*** (0.036)
# Children 10-14	-0.036 (0.039)
# Children < 10	-0.014 (0.041)
Secondary	0.085** (0.034)
Vocational	0.041 (0.045)
University	0.006 (0.045)
Employed	0.241* (0.129)
Unemployed	0.215

	(0.132)
Retired	0.017
	(0.133)
Disabled	-0.112
	(0.186)
Student	-0.047
	(0.137)
House work	0.011
	(0.134)
PCA Interest in reading	0.037**
	(0.016)
Sq PCA Interest in reading	-0.010*
	(0.006)
PCA Physical cultural capital	0.022
	(0.021)
Sq PCA Physical cultural capital	0.001
	(0.004)
PCA Cultural equipment	0.013
	(0.017)
Sq PCA Cultural equipment	-0.005
	(0.016)
Interest in theatre	0.338***
	(0.005)
Interest in music concerts	0.134***
	(0.009)
Interest in museums	0.068***
	(0.005)
Interest in listening music	0.092***
	(0.009)
Interest in performing arts	0.105***
	(0.006)
Constant	3.448***
	(0.202)
Observations	29,640
R-squared	0.507
Standard errors in parentheses	

*** p<0.01, ** p<0.05, * p<0.1

CHAPTER 3

THE CHANGING ROLE OF EDUCATION AS WE MOVE FROM POPULAR TO Highbrow Culture¹

Abstract

Education is the socioeconomic variable that has the greatest impact on cultural participation. A higher level of education leads to greater interest and taste for culture increasing the demand of culture. But education can also indirectly affect cultural consumption because the higher the level of education, the higher the expected income and, therefore, the greater the cultural consumption. In this paper, we analyze the effect of education on cultural consumption once the impact of income is controlled for. Using information on attendance to cinema, performing arts and visits to sites of cultural interest, we analyze how the effect of education changes between these activities. To do so, we estimate a Zero Inflated Ordered Probit (ZIOP) using the 2006 and 2015 Spanish modules of the European Union Statistics on Income and Living Conditions (EU-SILC). We find that the effect of education varies between activities, being its marginal effect more relevant for highbrow activities than for popular culture. On the contrary, given a certain level of education, an increase in income will bring more people to the cinema than to theaters or museums. This result is consistent with the idea that highbrow cultural consumption involves the comprehension of more complex symbolic elements, and individuals' decoding abilities depend more on education than on income.

¹ This chapter is co-authored with María José Pérez-Villadoniga and Juan Prieto-Rodríguez and it is published in the Journal of Cultural Economics, 2019.

1. INTRODUCTION

Traditionally, one of the main justifications for public policies in favor of cultural participation is based on Musgrave's (1959) definition of *merit goods*, as cultural goods could be considered as such. Furthermore, since Baumol and Bowen (1966), economists have been concerned about the characteristics of cultural consumers. The adequate knowledge of the determinants of the likelihood and the intensity of cultural participation is of great interest not only for public agencies and governments, but for art managers and cultural industries too. For the first ones, the public sector, it is essential to identify the profile of both attendees and non-attendees since cultural policies generally involve subsidies and tax benefits and it is important to determine who could benefit the most. For the private sector, a better understanding of the consumer profiles is needed to successfully develop their products and publicity campaigns to attract new consumers and to maintain the actual ones.

According to previous studies, education -including specific artistic training as in Kracman (1996)- is the socioeconomic variable with the highest forecasting accuracy on cultural demand (see for instance, Ateca-Amestoy and Prieto-Rodriguez, 2013). This is due to two effects. First, a direct effect, given that the higher the level of education the greater their cultural capital and, thus, the greater their interest in culture. From the economic theory point of view, this interest in culture could be an argument of the underlying utility function but not a determinant of its functional form, as in Becker and Murphy (1988). In any case, utility will depend both on current cultural consumption and cultural capital, and the higher the cultural capital the higher the demand for culture.² Second, an indirect effect, through people's purchasing power, since more education usually means higher income and, therefore, higher consumption of any luxury good, such as culture. This point was already raised by Seaman (2005 and 2006) and it is central to this paper where the role of education as determinant of cultural demand is analyzed.

Cultural capital may have a different importance depending on the type of cultural good. On the one hand, decoding symbolic elements, associated to highbrow culture, usually requires a certain endowment of cultural capital. On the other hand, popular culture can be enjoyed more easily regardless of individuals' cultural capital. As a result, the relative importance of education may vary

² From a sociological perspective, according to Bourdieu (1986), education contributes both to the embodied state and the institutionalized state of cultural capital. However, "it should be noted that the term 'cultural capital' is used in other disciplines to mean something different from its interpretation in economics. In sociology, the term is used, following Pierre Bourdieu, to mean an individual's competence in high status culture. In economic terms, this characteristic of people can be construed as an aspect of their human capital." (Throsby, 2003).

across cultural activities. We expect a higher impact as we move towards more intellectually demanding forms of culture.

To check whether this effect of education actually changes according to the cultural activity, it would be convenient to have the same referential framework, e.g., analyzing the consumption of different types of cultural goods by the same individual. In this paper, we take advantage of the data on individuals' declared consumption of three different cultural goods provided by the 2006 and 2015 modules of the European Union Statistics on Income and Living Conditions (EU-SILC) in Spain. Therefore, we analyze separately the probabilities of going to the cinema, attending live performances (concerts, opera, theatre, ballet, dance) and visiting sites of cultural interest (monuments, museums, archaeological sites and galleries) and we evaluate the marginal effects of education for each of these activities. By estimating Zero Inflated Ordered Probit models (ZIOP), we distinguish between attendants and non-attendants and, within this latter group, those who, although did not attend in the reference period, have nevertheless a significant probability of attending and those with a negligible likelihood of participation.

The article is structured as follows. Section 2 reviews the related literature. In Section 3 we describe the database used and Section 4 explains the empirical model estimated. The main results of the article are developed in Section 5. Lastly, Section 6 concludes.

2. EDUCATION AS DETERMINANT OF CULTURAL PARTICIPATION

There are mainly two models focused on experiences and tastes which are particularly relevant when explaining cultural consumption. Following Becker and Murphy (1988) in their "rational addiction" model, music consumption, as any other cultural good, may generate *addiction*. That is, there is an effect of past consumption on current utility, since the more culture the individual consumes, the more value she places on it. Alternatively, in "learning-by-consuming" models (Levy-Garboua and Montmarquette, 1996), individuals *learn* how to appreciate cultural goods as they consume them. The authors find that, for theatre plays, each time the consumer watches a play, she upgrades her expectations of her own *taste* for it. Considering both models, education plays an important role in explaining cultural demand. Using the analogy of the production function, education could be understood as a determinant of the "underlying technology" of the process by which cultural consumption is transformed into utility. For instance, the contemplation of an artwork will change the

observers' utility in a different way depending on their own education level. Those with higher education will probably be able to extract more utility and, thus, will have higher demand.³

Furthermore, education would also determine initial cultural capital and its depreciation rate. In other words, education level accounts for people's human capital, which, following Becker and Murphy (1988), influence people's ability to transform initial cultural capital and past cultural consumption into current cultural capital. For Levy-Garboua and Montmarquette (1996), it could alter the individual's preferences. As result, higher levels of education are associated with greater cultural demand, as they positively correlate with the stock of cultural capital and taste for culture (see, for example, Andreasen and Belk (1980), Borgonovi (2004), D'Angelo *et al.* (2010), Falk and Katz-Gerro, 2016; Ateca-Amestoy and Prieto-Rodriguez (2013), Willekens and Lievens, (2014, 2016)).

Moreover, consuming culture involves interiorizing and assimilating the symbolic elements that cultural goods incorporate. These elements become more complex as we move from popular to highbrow culture. Hence, we expect that more educated people were more likely to be able to decode more complex symbolic elements and, consequently, appreciate (highbrow) cultural goods. Therefore, the link between education and cultural demand should be stronger for highbrow activities. This argument is related to the so-called in sociology *cognitive hypothesis* that states that "cultural participation depends on a person's cognitive abilities, which is why educational stratification in cultural consumption is so evident, especially among consumers of high culture" (Notten et al., 2015).

As stated in the Introduction, education is positively correlated with income and earnings. Earnings, in turn, are associated with cultural consumption given that they determine the economic constraints faced by individuals when maximizing their utility, as in Becker and Murphy (1988). Individual earnings have proved to be relevant in many empirical papers such as Moore (1966), O'Hagan (1996), Cuadrado and Frasquet (1999), Borgonovi (2004) or Sisto and Zanola (2010). Income, as a determinant of the demand for culture, comprises two opposite effects (Throsby, 1994; and Zieba, 2009). On the one hand, greater income is expected to increase the demand for cultural goods, provided that those are normal goods or, as usually happens regarding cultural consumptions, luxury goods (Prieto-Rodriguez et al., 2005). On the other hand, it entails higher opportunity cost of leisure and lower time availability for cultural participation. In order to take into account this opportunity cost, it is usual in the literature to introduce in the empirical specification controls that account for labor status (as in Garcia-Enriquez and Echevarria, 2018, or Lazzaro and Frateschi, 2017).

³ Since its publication, Becker's (1965) approach of household production has been applied to model many decisions within the household.

Given that income and education are very strong markers of social class and their combination is a powerful predictor of (highbrow) cultural consumption, from the seminal paper by Baumol and Bowen (1966), cultural participation has been recurrently described as *elitist* by many empirical papers. Yet, this label should not fool us. Education, not social class, is the main variable to explain cultural participation, especially for highbrow culture. As Reeves (2015) states “arts participation [...] is not primarily explained through social status or social class but rather through education.” Therefore, we will focus on the effect of education, once household income is controlled for, and check its importance relative to the income impact.⁴

3. DATA AND METHODOLOGY

3.1 Database

The empirical analysis of this paper is based on the data from the European Union Statistics on Income and Living Conditions (EU-SILC) for Spain.⁵ It is a harmonized survey aimed at collecting comparable data on income, poverty, social exclusion and living conditions. In Spain it is conducted by the National Institute of Statistics. Data are collected yearly through face-to-face interviews considering both individual and household levels. It is a survey representative of the Spanish population and it gathers data on socio-demographic features such as gender, age, education level, labor status, income or health conditions. In addition, each year the EU-SILC incorporates a module with supplementary variables on a specific topic.⁶ The 2006 and 2015 modules refer to social participation during the previous year, including three cultural activities: attendance to the cinema, performing arts (theatre, concerts, the opera, ballet or dance) and visiting cultural sites (historical monuments, museums, art galleries or archaeological sites). Data do not allow us to go deeper in the classification of cultural activities, therefore, in what follows, we are considering cinema as part of popular culture, although some forms of cinema, such as independent cinema, could be not. Similarly, certain expressions under the label of performing arts in the surveys, e. g., pop and rock concerts, can be popular culture but are treated as (relatively) highbrow activities.

The EU-SILC 2006 was used by Falk and Katz-Gerro (2016) for an international comparative of the determinants of visiting sites of cultural interest. A possible limitation of these data is that answers are limited to quantitative categories and, additionally, they are not defined in the same way in both years.

⁴ For a general survey on other determinants of cultural participation see, for instance, Seaman (2006).

⁵ Some issues about the comparability between data from international EU-SILC are raised by O’Hagan, 2017.

⁶ Compared to other surveys, the EU-SILC is the most suitable for our purpose as it contains information on both education and income (Ateca-Amestoy and Villarroya, 2017).

Both waves were homogenized to the three categories established in the 2015 wave: zero attendance, between one and three times and more than three times in the previous 12 months.⁷ Our final sample is composed of 28,144 and 26,837 individuals in 2006 and 2015, respectively. A summary of the number of respondents belonging to each category for the three activities is provided in Table 1.

Table 1. Dependent variable values

Attendance frequency	Cinema	Perf. arts	Cult. sites
2006			
Zero	15,373 (54.6%)	18,606 (66.1%)	16,414 (58.3%)
Between 1 and 3 times	5,555 (19.7%)	5,904 (21.0%)	6,773 (24.1%)
More than 3 times	7,216 (25.6%)	3,634 (12.9%)	4,957 (17.6%)
Total	28,144	28,144	28,144
2015			
Zero	14,956 (55.7%)	17,989 (67.0%)	17,678 (65.9%)
Between 1 and 3 times	6,572 (24.5%)	5,342 (19.9%)	5,021 (18.7%)
More than 3 times	5,309 (19.8%)	3,506 (13.1%)	4,138 (15.4%)
Total	26,837	26,837	26,837

Note: row percentages in brackets

According to Table 1, more than half of the sample declares not having attended to the cinema, whereas for performing arts and visits to sites of cultural interest this proportion rises up to nearly two-thirds. This high proportion of non-attendees to each activity can be interpreted as a signal of the presence of a zero inflation problem. The main descriptive statistics for the whole sample, composed of individuals over 17 years of age, are presented in Table 2.

Table 2. Descriptive statistics

	2006		2015	
	Mean	SD	Mean	SD
Male	0.477	-	0.476	-
Age	47.832	18.25	50.774	18.62
Secondary	0.420	-	0.471	-
Tertiary	0.200	-	0.261	-
Weighted income	14.041	9.01	18.030	11.84
Single	0.293	-	0.302	-
Married	0.590	-	0.559	-
Household size	3.284	1.34	3.047	1.29
Very good health	0.163	-	0.151	-
Good health	0.499	-	0.557	-
Regular health	0.210	-	0.210	-
Part-time	0.051	-	0.063	-
Full-time	0.425	-	0.365	-
Student	0.074	-	0.078	-
Unemployed	0.164	-	0.145	-
Very populated	0.457	-	0.491	-
Regularly populated	0.214	-	0.213	-

⁷ In the 2006 wave, the original information regarding attendance is more disaggregated, defining 5 levels of attendance: None, 1-3 times, 4-6 times, 7-12 times and more than 12 times. We pool the last three groups in order to be consistent with the 2015 classification.

In order to capture the economies of scale in consumption within households, weighed income is defined, in thousands of euros, as the total household income divided by the square root of household members.

3.2 Empirical model

In order to explain cultural demand, we use a Zero Inflated Ordered Probit (ZIOP) model (Harris and Zhao, 2007). The ZIOP model is an extension of the basic ordered probit model to accommodate ordered dependent variables characterized by excessive zero observations. In the case of cultural participation, individuals can be classified into (potential) participants (attending a positive number of times or, eventually, zero) and non-participants. Consequently, sample zeros could be either people who wouldn't attend in any case (non-participants), or individuals who may have not attended, but could decide to do so under different circumstances (potential participants). Therefore, the two types of zeros are determined by different behaviors, so they cannot be assumed to come from the same data generation process. Additionally, for potential participants and attendants, ZIOP models allow analyzing differences in the frequency of attendance when it is measured as an ordered variable.⁸

Following the standard literature (see Seaman, 2006), we explain demand in the three selected cultural activities (cinema, performing arts and visits to sites of cultural interest) as a function of consumer's sociodemographic characteristics, paying special attention to education level and income. Formally, we jointly estimate the following two equations of the ZIOP model to explain both the probability of participation and the intensity of attendance (conditional on being a participant):

$$Prob\ of\ Participation_{ij} = f(Soc_{ij}, Edu_{ij}, Income_{ij}, Lab_{ij}, Health_{ij}, Geo_{ij}) \quad (1)$$

$$Intensity\ of\ Attendance_{ij} = f(Soc_{ij}, Edu_{ij}, Income_{ij}, Lab_{ij}, Health_{ij}, Geo_{ij}) \quad (2)$$

where the dependent variable *Prob of Participation_{ij}* is a non-observable dummy variable, that will be endogenously defined by the model, classifying individuals either as (potential) participants or non-participants; and *Intensity of Attendance_{ij}* is an ordinal variable which takes value zero when the individual *i* declares not having attended to the activity *j* but is considered as a potential participant by the model, value 1 when the individual has attended between one and three times, and value 2 when she has attended more than three times.

⁸ If available data on attendance were a count variable, the appropriate model would be a Zero Inflated Negative Binomial (ZINB) model (see Ateca-Amestoy, 2008). Examples of ZIOP models used to analyze cultural consumption include Downward *et al.* (2011) for modelling sports participation and Borowiecki and Prieto (2015) for video games playing.

The probability of participation, as modelled by Equation (1), will split the sample into two groups that might be so different that will be associated to two different data generation processes. For (potential) participants, the intensity in their demands will be modelled by Equation (2). Therefore, it could be hypothesized that some of the explanatory variables may differentially affect both parts of this decision process. For instance, as suggested by Fernandez et al. (2009) “[class] probabilities rely on variables related to preferences (age, gender, education, movie valuations, etc.) whereas the behavioural functions depend on variables likely to be related to economic restrictions (i.e. the budget line and the opportunity cost of time) faced by the consumers within this given theoretical structure, the model is indeed identified.” The underlying assumption derived from this paper is, hence, that variables related to taste will have a stronger influence on the probabilities of non-attendance and variables related to economic restrictions will have a stronger influence on the frequency of attendance conditional on being a participant.⁹ However, instead of setting *a priori* which variables determine each decision, we have preferred to include the same set of explanatory variables in both equations and check, from the significance of the estimated coefficients, whether this hypothesis is correct.

Below we discuss the expected overall effect of the covariates that we have included in the empirical specification. First, Soc_{ij} is a vector of socio-demographic variables including gender, age, marital status and household size. Cultural demand presents a large gender effect since women are more likely than men to participate, especially in high-brow cultural activities (Christin, 2012; Gray, 2003; Muñiz *et al.*, 2014). A possible explanation given in sociology for this gender gap relates to “gender-specific socialization patterns in the family” (Willekens and Lievens, 2016) whereby women may find the development of cultural capital more valuable than economic capital. Moreover, females may find their cultural capital more valued in the labor market, as professional occupations related to the arts and humanities tend to be more feminized.¹⁰ Age is explanatory of the demand of culture, although its effect depends on the particular activity (Colbert *et al.*, 1998; Gray, 1998; Borgonovi, 2004) in line with learning-by-consuming processes (McCain, 1979; 1995) and rational addiction theory (Becker and Murphy, 1988). Additionally, individuals’ leisure time is affected by marital status. Having a partner could affect leisure preferences favoring the coordination between each one’s hobbies, changing the probability of participation and its intensity. Besides, it might allow for more leisure time if, for example, once the presence of children is controlled, they could share housework and, thus, increase their leisure time and their frequency of attendance. Therefore, we include dummies indicating whether the

⁹ From a more sociological point of view, Yaish and Katz-Gerro (2012) discuss the different role of tastes and restrictions in shaping cultural participation suggesting that “participation is constrained to a larger degree by financial resources than by tastes and to a lesser degree by cultural resources [...] tastes are shaped to a greater degree than participation by socialization processes and through the habitus and, to a lesser degree, by financial resources.”

¹⁰ According to Figueiredo et al. (2015), on average for Portugal, Spain and Italy, only 8.3 percent of males are employed at Education, Humanities & Arts while 23.2 percent of females work in these occupations.

individual is *single* or *married*, being other situations (separated, divorced or widower) the reference group.

Second, Edu_{ij} comprises two dummy variables, *secondary* and *tertiary* education, leaving *primary* education as the reference category. Since these variables capture academic credentials, they would be mainly part of the institutionalized state of the cultural capital, as conceptualized by Bourdieu (1986). This, in turn, affects (future) cultural consumption.

Third, $Income_{ij}$ are the earnings allocated to each household member. Even when individual income is available, it may be better to use household's income so as to take into consideration that economic opportunities are weighted in relation to the number of household members, using the criteria proposed by the Organisation for Economic Co-operation and Development (OECD).

Fourth, Lab_{ij} includes dummies for labor status: *part-time*, *full-time*, *unemployed* and *student*, being *retired* and *other possible situations* the reference category. The individual's occupational situation is an indicator of the working time and, thus, the remaining time for leisure. Its effect could be twofold, as being employed affects income positively thus leading to greater demand but, conversely, tends to reduce free time availability. Since labour status is related to time availability and income constraints, we would expect it to have a larger impact on the intensity of attendance.

Fifth, $Health_{ij}$ accounts for people's declared health status, including *very good health*, *good health*, and *fair health* situations, being *poor* and *very poor health* conditions the reference category. Health condition is another core determinant, which is often neglected, of cultural demand. Given that attendance to the cinema and performing arts, and visits to sites of cultural interest are performed outside the house and require good mobility, health situation plays an important role in determining cultural engagement, as noted previously in the literature (Samdahl and Jekubovich, 1997; Scherger, 2009; or Hallmann *et al.*, 2017).

Lastly, Geo_{ij} stands for geographical control variables that classify individuals' place of residence. It includes controls for population size (*highly populated*, *moderately populated* and *sparsely populated*) and a set of regional dummies to account for unobserved geographic differences. As noted by Cuadrado and Frasquet (1999) or Gray (2003), cultural participation is mostly an urban phenomenon. Due to the supply diversity linked to the size of regions and cities, regional controls are also needed.

4. RESULTS

In this section, we first discuss the determinants of the probability of participating in each of the three activities, the inflation equation of the ZIOP. Then, we present the impact of the explanatory variables on the frequency of attendance, the ordered probit equation.

Table 3. Zero-inflated ordered probit estimation 2006

	2006						2015					
	Cinema		Performing arts		Cultural sites		Cinema		Performing arts		Cultural sites	
	(1a) Particip y	(2a) Intensit y	(3a) Particip y	(4a) Intensit y	(5a) Particip y	(6a) Intensit y	(1b) Particip y	(2b) Intensit y	(3b) Particip y	(4b) Intensit y	(5b) Particip y	(6b) Intensit y
Male	-0.30*** [-4.74]	-0.04 [-1.48]	-0.33*** [-2.72]	-0.09 [-1.18]	-0.12*** [-6.66]	-0.02 [-0.87]	-0.24*** [-5.46]	-0.04 [-1.61]	-0.38*** [-5.87]	-0.10*** [-2.76]	-0.09*** [-5.25]	-0.02 [-0.63]
Age	-0.09*** [-4.87]	0.01 [0.73]	-0.02 [-1.09]	-5e-04 [-0.03]	0.05*** [11.13]	0.03*** [4.54]	-0.02** [-2.39]	-0.04*** [-5.77]	0.03** [1.98]	-0.04*** [-5.05]	0.04*** [9.89]	0.02*** [3.07]
Age square	3e-04** [2.13]	-9e-05 [-0.89]	0.4 [-0.93]	1.2e-04 [0.77]	0.4*** [-11.99]	0.4*** [-3.27]	0.4*** [-3.20]	4e-04*** [6.20]	0.4*** [-4.83]	4e-04*** [6.26]	0.4*** [-11.24]	-2e-04** [-2.24]
Secondary	0.46*** [6.93]	0.35*** [8.16]	0.44*** [3.67]	0.32*** [4.32]	0.47*** [21.41]	0.34*** [8.95]	0.31*** [4.70]	0.43*** [7.52]	0.50*** [5.13]	0.24*** [4.00]	0.41*** [15.17]	0.21*** [3.94]
Tertiary	0.91*** [10.22]	0.60*** [12.19]	0.93*** [6.21]	0.59*** [6.29]	0.91*** [33.43]	0.65*** [15.78]	0.67*** [9.22]	0.66*** [11.04]	0.76*** [6.84]	0.64*** [8.89]	0.92*** [29.83]	0.50*** [9.03]
W. income	0.02*** [3.49]	0.03*** [10.44]	0.01** [2.06]	0.03*** [11.34]	0.03*** [22.54]	0.02 [8.89]	0.03*** [7.88]	0.03*** [13.34]	0.01* [1.65]	0.03*** [15.72]	0.04*** [24.46]	0.01*** [5.06]
W. income sq.	-1e-04*** [0.4]	-1e-04*** [0.4]	-1e-04*** [0.4]	-1e-04*** [0.4]	-1e-04*** [0.4]	-6e-05*** [0.5]	-2e-04*** [0.4]	-2e-04*** [0.4]	-7e-05*** [0.4]	-2e-04*** [0.4]	-2e-04*** [0.4]	-3e-05*** [0.4]
Single	-5.02*** [-5.21]	-7.27*** [6.29]	-2.74*** [-3.61]	-6.02*** [3.03]	-10.34*** [1.32]	-3.86*** [1.57]	-5.89*** [-4.26]	-7.31*** [3.97]	-1.54*** [-3.15]	-9.33*** [2.72]	-12.41*** [1.53]	-1.32*** [1.22]
Married	0.13 [1.45]	-0.23*** [-3.86]	0.26*** [2.68]	-0.10* [-1.66]	0.15*** [5.15]	-0.05 [-1.09]	0.03 [0.52]	-0.14*** [-2.77]	0.09 [0.96]	-0.04 [-0.91]	0.15*** [5.11]	-0.07 [-1.42]
Household size	-0.14*** [-5.41]	-0.02* [-1.84]	-0.15*** [-4.10]	-0.02 [-1.34]	-0.10*** [-14.38]	-0.07*** [-5.98]	-0.10*** [-4.78]	-0.01 [-0.96]	-0.16*** [-5.32]	-0.06*** [-4.44]	-0.13*** [-15.63]	-0.05*** [-3.98]
Very good health	0.67*** [5.46]	0.18* [1.87]	0.57* [1.92]	0.29*** [3.30]	0.62*** [17.00]	0.22*** [3.51]	0.76*** [6.43]	0.49*** [4.60]	1.09*** [5.77]	0.21** [2.26]	0.70*** [15.24]	0.23*** [2.62]
Good health	0.66*** [6.74]	0.08 [0.85]	0.59*** [5.30]	0.17 [1.88]	0.44*** [14.30]	0.16*** [2.82]	0.59*** [5.99]	0.40*** [3.94]	0.72*** [5.92]	0.21* [2.38]	0.51*** [12.47]	0.15* [1.89]
Fair health	0.40*** [4.01]	0.02 [0.22]	0.33*** [2.92]	0.12 [1.26]	0.35*** [10.98]	0.11 [1.85]	0.31*** [3.10]	0.22* [2.13]	0.37*** [3.21]	0.05 [0.59]	0.29*** [6.75]	0.03 [0.36]
Part-time	-0.01 [-0.06]	0.10 [1.75]	-0.04 [-0.14]	0.04 [0.58]	-0.06 [-1.42]	0.06 [0.97]	-0.08 [-0.70]	0.25** [3.81]	0.16 [0.44]	0.11 [1.68]	-0.07 [-1.64]	-0.06 [-0.88]
Full-time	0.09 [1.05]	0.17*** [3.98]	-0.15 [-0.51]	0.09 [1.19]	0.02 [0.63]	-0.04 [-0.98]	0.03 [0.36]	0.21*** [3.95]	-0.29* [-2.07]	0.19*** [3.87]	-0.07*** [-2.31]	-0.03 [-0.70]
Student	0.14 [0.61]	0.65*** [10.26]	0.37 [0.54]	0.52*** [7.09]	0.77*** [17.74]	0.38*** [6.45]	0.15 [0.92]	0.45*** [6.47]	-0.51 [-1.25]	0.55*** [6.72]	0.55*** [10.85]	0.26*** [3.31]
Unemployed	0.30*** [2.79]	-0.18** [-2.05]	0.22* [1.93]	-0.03 [-0.45]	0.09*** [2.58]	-0.02 [-0.29]	-0.36*** [-3.83]	0.04 [0.72]	-0.43*** [-2.33]	-0.04 [-0.58]	-0.30*** [-8.34]	-0.07 [-1.08]
Very populated	0.30*** [3.97]	0.30*** [7.98]	0.13 [0.87]	0.06 [1.11]	0.24*** [10.95]	0.22*** [6.49]	0.36*** [6.34]	0.17*** [4.92]	-0.01 [-0.08]	0.14*** [4.16]	0.25*** [11.09]	0.15*** [3.99]
Regularly pop.	0.09 [1.16]	0.24*** [5.88]	0.09 [0.71]	-0.01 [-0.24]	0.16*** [6.68]	0.10*** [2.62]	0.18*** [2.90]	0.26*** [6.51]	-0.02 [-0.17]	0.18*** [4.29]	0.12*** [4.53]	0.14*** [3.22]
Constant	3.61*** [4.41]		1.33 [0.71]		-3.23*** [-21.91]		0.74* [1.65]		0.48 [0.56]		-2.86*** [-20.75]	
cut1	0.87*** [2.83]		1.46*** [3.07]		-3.82*** [-5.64]		0.18 [0.69]		0.53** [1.98]		-4.54 [-0.05]	
cut2	1.78*** [5.84]		2.41*** [5.49]		2.04*** [8.43]		1.35*** [5.46]		1.45*** [5.71]		1.29*** [5.42]	
Observations												
Number of zeros	28057 15317		28057 18545		28057 16355		26837 14956		26837 17989		26837 17678	
chi2	1746.70		1039.15		982.891		1460.86		1534.20		756.714	
Log likelihood	-21333.2		-21166.9		-23217.9		-20891.2		-19890.5		-19881.6	
BIC	43434.5		43102.0		47204.0		42547.1		40545.8		40527.9	

Notes: z-score in parentheses *** p<0.01, ** p<0.05, * p<0.1. All models include controls for region of residence.

4.1 Participation decision

Table 3 displays the determinants of the probability of ever attending to the cinema (columns 1a, 1b), performing arts (3a, 3b) or visiting cultural sites (5a, 5b), respectively, in 2006 (a) and 2015 (b). A negative sign is interpreted as reducing the probability of participation (i.e. increasing the likelihood of being an absolute zero). In general, the results are as expected and they are stable over the period considered.

Regarding gender, females are significantly more likely to participate in any of the three activities considered, especially in performing arts. This result is consistent with previous findings in the literature; for instance, Sisto and Zanola (2010), for cinema attendance; Gray (1998) for museums attendance or Colbert *et al.* (1998) for theatre attendance. We find an increasing probability of attending performing arts and visiting sites of cultural interest as people get older although the effect is concave, decreasing after age 40. Regarding cinema, we find a significant negative effect of age, as in Fernandez-Blanco *et al.* (2009).

In line with our previous discussion, higher education levels are associated with a greater probability of participating in the three cultural activities, and the magnitude of the effect increases with the education level achieved. Besides, the effect of income is positive and significant in the three cases. Therefore, conditional on education (and other characteristics), individuals with higher income are more likely to participate in cultural activities, although at a diminishing rate.

Compared to their separated, divorced or widowed peers, singles are less likely to go to the cinema, whereas married people are more prone to visit sites of cultural interest, in line with the effect found by Willekens and Lievens (2016).

In the case of individuals who are currently working, time constraints do not seem to affect their likelihood of ever participating in any of the activities considered. Students have more chances of visiting sites of cultural interest, while those who are unemployed in 2015 show far lower probabilities of being participants in any of the three activities. This last result is consistent with Kunze and Suppa's (2017) findings but the effect is not so clear in our 2006 sample.

In line with the findings of Samdahl and Jekubovich (1997), Scherger (2009) and Hallmann *et al.* (2017), individuals with better health conditions are more likely to participate in the cultural activities analyzed. Perhaps, as they are all performed outside of the home, those suffering from health illness have lower chances to enjoy either of the three cultural activities.

Similar to the effects found in van Eijck and Knulst (2005); Borgonovi (2004) or Purhonen *et al.* (2011), people who live in highly or medium populated areas exhibit more chances of going to the cinema or performing arts and visiting museums. The explanation is straightforward, as larger cities have a wider supply of cultural products, both in terms of the number of cinemas and the types of films they offer. Bigger cities also gather more monuments and museums, which explains why people living in those cities are more likely to visit sites of cultural interest. However, this variable is not statistically significant to explain performing arts' attendance.

4.2 Intensity of attendance

In columns (2a, 2b), (4a, 4b) and (6a, 6b) of Table 3 we present the determinants of the frequency of attendance for the ordered probit equation. Again, results are relatively stable over time.

In the case of performing arts, women that participate do it more habitually than men, as found repeatedly in the literature (Ateca-Amestoy, 2008; or Purhonen *et al.*, 2011 among others). For the other two activities, we only find a significant gender effect for the participation decision but not for the intensity conditional on being a participant.

Young people tend to go more often to the cinema and performing arts, as in Gray (1998), or Yamamura (2009). Accordingly, we find a recovery in the level of attendance for participants in these two activities aged 40 or more years.

Individuals with higher educational achievements are not only more likely to be participants, but also attend more frequently to the cinema, performing arts and cultural sites (see for instance Ateca-Amestoy, 2008; Borowiecki and Marvao, 2017; van Eijck and Knulst, 2005; or Wen and Cheng, 2013).

Similarly, income has a positive and concave effect on the intensity of cultural participation in the three cultural activities, consistent with culture being a normal (or luxury) good (see Sisto and Zanola, 2010). The estimated coefficients for the intensity equation are larger relative to those estimated for the participation equation for cinema and performing arts. This would be the expected result if income acted mainly as a financial barrier. The fact that, in the case of visits to cultural sites, especially for the 2015 wave, the income effect is lower for the intensity of the attendance rather than the participation equation may indicate that income is as well related to preferences or social class position (Willekens and Lievens, 2014).¹¹

While single individuals are more likely to be never-attenders, those who actually participate tend to go more often to the three cultural activities. On the other hand, those who are married tend attend to

¹¹ We would like to thank an anonymous referee for pointing us in this direction.

the cinema less frequently. Regarding labor status, working individuals have a higher attendance rate to the cinema, and those working full-time also go more often to the performing arts. Among all groups, similarly to Gray (1998), Cuadrado and Frasquet (1999), students are the group showing higher regularity in the participation to any of the three cultural activities.

In line with the results of the participation equations, healthier individuals exhibit higher rates of attendance to cultural activities. Living in highly or medium populated places encourages both participation and intensity to the three cultural activities when compared with those living in scarcely populated cities (Weng and Cheng, 2013).

4.3 The changing role of individuals' cultural capital as we move from popular to highbrow culture

In this section we provide a more thorough analysis of the role of education on cultural participation. Formal education can be regarded as part of the generic cultural capital of people. We expect that the importance of cultural capital (approximated through education) will grow as the symbolic elements incorporated by cultural goods become more complex, that is, highbrow activities.

As we already mentioned, apart from attendees, our empirical model allows distinguishing two types of non-attendees, classifying them as absolute zeros –those who do not participate and are not expected to do so- and recoverable zeros -whose cultural participation has been zero but could have participated. Table 4 displays the average forecasted probabilities associated to each activity by educational level. These probabilities were evaluated at the mean values of the covariates, i. e., the probability of each participation status of the average person were she assigned different levels of education.

Table 4. Probabilities of attendance by education level

	No participant			Participant								
	Absolute zero			Recoverable zero			Low demand			High demand		
	Prim Ed.	Sec Ed	Ter Ed	Prim Ed.	Sec Ed	Ter Ed	Prim Ed.	Sec Ed	Ter Ed	Prim Ed.	Sec Ed	Ter Ed
2006												
Cinema	37.49	21.78	10.90	30.25	27.22	23.11	20.26	27.42	30.77	12.00	23.58	35.22
Performing arts	34.37	19.90	9.14	42.32	41.73	37.58	17.21	25.73	32.22	6.10	12.63	21.06
Cultural sites	73.63	56.52	39.14	2.7E-06	6.7E-07	1.5E-07	19.70	27.31	30.73	6.67	16.17	30.13
2015												
Cinema	45.07	33.21	21.25	25.71	20.47	18.00	21.68	29.47	34.47	7.53	16.85	26.27
Performing arts	37.35	20.65	14.03	41.82	45.68	35.96	15.34	23.13	29.64	5.49	10.54	20.38
Cultural sites	82.71	70.22	50.93	1.2E-06	6.7E-07	2.0E-07	12.37	19.07	25.83	4.92	10.71	23.25

Regardless of the educational level, considering low and high demands jointly, cinema presents the highest probabilities of attendance, thus it is the most popular cultural activity although less so in

2015, mostly due to an important drop in the high demand probability.¹² On the other hand, looking at the probabilities of being an absolute zero, visits to cultural sites are the least popular activity. Moreover, almost all those who decide not to visit cultural sites are not recoverable, i. e., would not attend in any case. In contrast, performing arts exhibit the largest proportion of non-attendants that could be attracted to participate (recoverable zeros). Regarding differences in attendance by education, we find that more educated individuals show a much lower probability of being an *absolute zero* for the three cultural activities, being this effect more pronounced in 2006.

To have an insight on the representativeness of the results above, in Table 5 we display correlations between education and the different probabilities of attendance to each activity. A correlation coefficient close to one implies that differences in the probability of attendance within educational groups will tend to zero, while individuals with different educational attainments will exhibit different probabilities.

First, for the three activities, we find a positive and strong correlation between education and the predicted probabilities of having either low or high demand. This correlation is weaker for cinema attendance than for highbrow activities. Additionally, this correlation is especially strong for the probability of low demand of performing arts and the probability of high demand for visits of cultural sites.

Table 5. Correlations between education and probabilities of attendance

	Absolute zero	Recoverable zero	Low demand	High demand
2006				
Cinema	-0.6878	-0.0641	0.6175	0.6823
Performing arts	-0.6645	0.1084	0.7713	0.6909
Cultural sites	-0.7902	-0.3151	0.6360	0.7635
2015				
Cinema	-0.6719	-0.0782	0.6689	0.6325
Performing arts	-0.6650	0.1074	0.7590	0.6671
Cultural sites	-0.7530	-0.1684	0.6914	0.6867

While education can be an important factor to identify absolute zeros (due to the high and negative correlations), forecasts of recoverable zeros rely mainly on other variables rather than education. These results suggest that, education plays a role in shaping individuals' cultural participation and that this role varies between activities, being stronger as we consider highbrow activities with a larger symbolic content. This pattern remains stable over time as differences in correlations between 2006 and 2015 are minor.

¹² This could be related to the appearance and development of close substitutes such as Netflix, HBO or Amazon Prime Video to the traditional consumption of cinema at movie theatres.

In order to provide a more thorough insight, in Table 6 we report the estimated marginal effect of education on the probability of being an absolute or recoverable zero, or showing positive attendance, either with low or high demand. These effects are always computed considering *primary education or lower* as the reference category. In order to check the robustness of the effect of education, we have computed these effects at two different points, changing the *ceteris paribus* clause. Thus, we evaluate the marginal effects:

- (1) at the observed values of the independent variables
- (2) as in the previous case but fixing income at its mean (i.e. everything changes but income)

For each activity, comparison of rows (1) and (2) only implies a change in the reference income level. We interpret this difference as the result of relaxing the *ceteris paribus* clause just for the income variable. Hence, results may be understood as related to the underlying effect of income.

Table 6. Marginal effects of education (in %)

	No participant		Participant					
	Absolute zero		Recoverable zero		Low demand		High demand	
	Sec Ed	Ter Ed	Sec Ed	Ter Ed	Sec Ed	Ter Ed	Sec Ed	Ter Ed
2006								
Cinema								
(1) At observed values	-11.572	-21.177	-2.097	-4.116	3.991	6.428	9.678	18.866
(2) At observed values except income (at its mean)	-11.775	-21.507	-2.308	-4.589	4.314	6.900	9.770	19.195
Performing arts								
(1) At observed values	-11.927	-22.186	-1.006	-4.200	6.785	12.340	6.149	14.046
(2) At observed values except income (at its mean)	-12.023	-22.333	-1.156	-4.633	7.120	12.955	6.059	14.011
Cultural sites								
(1) At observed values	-15.705	-31.431	<i>-4E-06</i>	<i>-5E-06</i>	6.253	8.970	9.452	22.461
(2) At observed values except income (at its mean)	-16.199	-32.452	<i>-4E-06</i>	<i>-5E-06</i>	6.714	9.643	9.485	22.809
2015								
Cinema								
(1) At observed values	-8.136	-16.827	-5.017	-7.005	4.690	7.811	8.463	16.021
(2) At observed values except income (at its mean)	-8.282	-17.103	-5.365	-7.630	5.240	8.625	8.407	16.109
Performing arts								
(1) At observed values	-13.604	-19.470	2.671	-5.560	6.061	11.189	4.872	13.841
(2) At observed values except income (at its mean)	-13.668	-19.551	2.484	-6.303	6.490	12.176	4.694	13.678
Cultural sites								
(1) At observed values	-11.739	-29.006	<i>-1E-06</i>	<i>-3E-06</i>	5.633	11.020	6.106	17.986
(2) At observed values except income (at its mean)	-12.145	-30.325	<i>-1E-06</i>	<i>-3E-06</i>	6.123	12.127	6.022	18.198

Note: not significant (at the 5 percent level) marginal effects in italics

Overall, we find that, for both considered years and the three cultural activities, the higher the level of education the larger the drop in the probability of being an *absolute zero* and, simultaneously, the larger the rise in the probabilities of *low* and *high attendance*. Marginal effects on recoverable zeros are usually the smallest and not significant in most cases. More specifically, marginal effects for people with tertiary education do not just involve becoming participants, but also going on to exhibit a large demand. For secondary education, marginal effects are lower and, additionally, it seems that getting a secondary degree makes people more prone to participate but not necessarily with a high demand for highbrow activities.

Between row comparisons suggest that potential measurement errors due to collinearity of education with income are quite small. It is noteworthy to mention that the probability of leaving the absolute non-attendees group (and, thus, becoming a participant) as education increases is lower for cinema, being this effect larger in 2015. Furthermore, as education increases, people most likely move from absolute zeros to attendants of highbrow activities as shown by the non-significant marginal effects of becoming a recoverable zero for these activities. This impact of education on cultural participation is especially large in the case of visits to cultural sites. Overall, it seems that education has a larger effect on highbrow activities rather than cinema.

Finally, in Table 7 we display the marginal effects of income on the probabilities of participation and intensity of attendance, in order to assess its importance relative to education. The marginal effect of income on the probability of exhibiting a high demand does not increase for highbrow activities, in fact it is slightly larger for cinema. Therefore, although income may be related to both individual's tastes and social status (affecting cultural participation) and financial restrictions (affecting intensity of attendance), in contrast to the effect of education, income alone does not seem to increase individuals' high demand of highbrow activities more than popular culture demand.

Furthermore, by comparing marginal effects in Tables 6 and 7, it is clear that, although the effect of income is significant, it is much lower than that of education. For example, to achieve the same increase in the probability of having high demand of any cultural activity associated to a change from primary to tertiary education, we would need to increase individual's weighted income in, at least, 30.000€, which means to triplicate the average income.

Table 7. Marginal effects of income (in %)

	No participant	Participant		
	Absolute zero	Recoverable zero	Low demand	High demand
2006				
Cinema				
(1) At observed values	-0.351	-0.286	0.086	0.550
(2) At observed values except education (at its mean)	-0.394	-0.329	0.142	0.580
Performing arts				
(1) At observed values	-0.262	-0.486	0.299	0.450
(2) At observed values except education (at its mean)	-0.282	-0.524	0.356	0.450
Cultural sites				
(1) At observed values	-0.910	0.000	0.363	0.547
(2) At observed values except education (at its mean)	-1.001	0.000	0.429	0.572
2015				
Cinema				
(1) At observed values	-0.509	-0.248	0.201	0.556
(2) At observed values except education (at its mean)	-0.553	-0.277	0.272	0.557
Performing arts				
(1) At observed values	-0.210	-0.553	0.307	0.455
(2) At observed values except education (at its mean)	-0.227	-0.584	0.358	0.453
Cultural sites				
(1) At observed values	-0.849	0.000	0.396	0.453
(2) At observed values except education (at its mean)	-0.921	0.000	0.453	0.467

* Given the definition of income, these marginal effects are associated with a change in income of 1000 euros.

5. CONCLUSIONS

The main objective of this paper is to analyze the role of education on participation in three cultural activities: cinema attendance, live performances and visits to sites of cultural interest. To do so, we estimate a Zero Inflated Ordered Probit model using data from the 2006 and 2015 modules of the European Union Statistics on Income and Living Conditions (EU-SILC). This specification allows us to consider participation and intensity of the demand as a joint decision. The use of two different modules of EU-SILC allows to check the stability of the results over time. However, these two surveys cannot be linked over time. Thus, estimated effects cannot be interpreted as causal effects but reflecting correlations.

Given the diverse nature of the three cultural activities considered, we find quite different patterns of consumption. In what concerns cinema participation, for low education attainments, we observe a larger demand, compared to performing arts and visits to sites of cultural interest. Cinema is the most popular activity, probably because it is produced by an industry whose objective is to reach as much public as possible. Regarding the performing arts participation, non-attendants are the most easily recoverable, especially those with secondary education, whose probability of belonging to the *recoverable zero* category is the largest of all individuals' groups. When considering visits to sites of cultural interest, such as monuments and museums, the most striking outcome is the strong polarization in attendance. As individuals' educational achievements increase, the change from absolute zero to high demand attendees is especially high.

By distinguishing between participation and intensity of demand, we find that the gender effect is not as simple as it is sometimes asserted. Women are more likely to participate in the three activities considered but, conditional on their participation, they only attend more frequently than men to performing arts. We also find an increasing probability of attending performing arts and visiting sites of cultural interest as people get older, opposite to the estimated effect for cinema.

Taking advantage of the data on self-declared health status, seldom included in other surveys, we find that, as expected, healthier individuals exhibit higher rates of participation and attendance to cultural activities.

Additionally, consistent with the *normal good* nature of cultural goods, income has a positive, and concave, effect on both participation and intensity of consumption of the three cultural activities. The inclusion of this variable allows us to get a more accurate estimate of the effect of education on cultural participation as education and income are closely correlated. Our results suggest that, for cinema and performing arts, income acts mainly as a financial barrier, since its effect is larger on the intensity of attendance rather than on the participation decision. In contrast, regarding visits to cultural sites, the

income effect is larger for the participation part of the decision, indicating that income is related to tastes and, in sociological terms, to class position (as in Willekens and Lievens, 2014).

Related to individuals' cultural capital, we find that higher levels of education are associated with higher chances of participating in cultural activities. In addition, getting a secondary degree makes people more prone to participate but to a lesser extent than having a university degree. We have also found that the education effect varies between activities, being its marginal effect more relevant for highbrow activities. These results regarding formal education are consistent with the idea that cultural consumption involves the comprehension of symbolic elements, that are more elaborate for highbrow than popular culture.

In contrast to the effect of education as we move to highbrow activities, the fact that the marginal effect of income on cinema is the largest suggests that, given a certain level of education, an increase in income will bring more people to the cinema than to theaters or museums. On the contrary, for a given level of income, more educated individuals are more likely to attend highbrow activities. Hence, although income may be related to the individual's tastes and preferences (affecting cultural participation), income alone does not seem to increase individuals' capability of decoding the symbolic content of highbrow culture. In sum, education seems to be more crucial in determining cultural participation than income.

All these findings present a dilemma when designing cultural policy. On the one hand, in order to reduce the importance of economic restrictions, policy makers could consider reductions in the indirect tax paid for cultural goods, or increases in the subsidies for their production. The consequent fall in prices would have a direct effect on cultural demand. However, these fiscal policies would be regressive, benefiting more those individuals with higher income (Prieto-Rodriguez *et al.*, 2005). Moreover, the effectiveness of this policy in order to promote highbrow culture can be limited if, as suggested by our results, financial restrictions are more relevant for lowbrow activities.

On the other hand, in order to enhance cultural participation through individuals' cultural capital, cultural policy should be integrated into education policies oriented to improve people's taste for the arts. A main drawback of any policy aimed at the formation of artistic tastes is that its effects will only arise in the long term. In the past, policies of *tastes' training* were combined with cultural programs on radio and television. Nowadays, technological changes have eliminated the captive audiences of these media. Although supply is now much diverse, only those that are already interested in the arts demand these contents. Therein lies the importance of early and eventually compulsory education to develop artistic interests and tastes among the population.

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CHAPTER 4

PLAYING A PLAY: ONLINE AND LIVE PERFORMING ARTS CONSUMERS PROFILES AND THE ROLE OF SUPPLY CONSTRAINTS¹

Abstract

In this paper, the relation between live and online highbrow performing arts consumption is examined. Specifically, we analyze whether restrictions on live cultural participation can be overcome by online consumption and the differences in the profiles of live and online consumers. To this end, using the Survey of Cultural Habits and Practices in Spain 2014-2015, two Bivariate Probit models using information about online and live consumption of highbrow performing arts in Spain are estimated. We separately analyze theatre and musical performing arts (ballet, opera, Spanish operetta and classical music concerts). Our results show that the profiles of live and online cultural consumers differ. However, we also find a complementarity effect between live and online consumption. Therefore, the online channel could be a valuable tool for spreading access to culture that might overcome some restrictions on live cultural participation, such as high prices and time constraints. Alternatively, if this is true only for people already consuming culture but not attracting new consumers, the online channel would help just to reproduce old patrons of inequality in cultural access but not to democratize highbrow culture.

1. INTRODUCTION

Cultural participation is defined as “any activity that, for individuals, represents a way of increasing their own cultural and informational capacity and capital, which helps to define their identity, and/or allows for personal expression” (UNESCO, 2012, p.51). Given the spread of the Internet access during the last two decades, and its growing opportunities, novel forms of cultural consumption have appeared recently. In this regard, online access to cultural contents has noticeably changed the way

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people consume culture, allowing the broadcast of cultural products which, otherwise, would be less accessible for the wide public. Online availability of cultural contents, thus, enables certain consumers to overcome some of the barriers that in-person attendance imposes, such as transport costs, mobility problems or time restrictions. Moreover, the online channel could allow cultural managers to reach new cohorts of audience beyond the traditional cultural consumer. Therefore, online availability of cultural goods could be a way to democratize highbrow culture. However, as already pointed out by Mihelj et al. (2019), it could also be possible that online culture was an option only attractive to those that already consume culture, facilitating its access in an easier and cheaper way but just to the aficionado group and not attracting new consumers and, hence, reproducing old patrons of cultural access inequality.

So far, the determinants of *live* (in-person) cultural participation, including performing arts, have been widely examined (e.g. Seaman, 2005 and 2006; Dewenter and Westermann, 2005; Ateca-Amestoy, 2008; Sisto and Zanola, 2010; Ateca-Amestoy and Prieto-Rodríguez, 2013; Falk and Katz-Gerro, 2016). However, online performing arts consumption has been more scarcely studied. Nowadays, it is a major concern for policy makers and cultural managers how online and in-person cultural consumption are interconnected, and whether the former complements or substitutes the latter. The existing studies on this issue find a complementarity pattern between live and online and other alternative channels for performing arts demand (Montoro-Pons and Cuadrado-García, 2011; Nguyen et al., 2014; Bakshi and Throsby, 2014; Chen, 2015). However, not many empirical studies have gone further, analyzing how live cultural participation constraints, such as (high) prices, supply and time restrictions or lack of interest affect the engagement in online culture. Therefore, it is worth studying whether restrictions to live cultural consumption can be overcome by an easier and highly diverse access to online cultural contents.

To explore these ideas, we analyze live and online demands of *theatre* and *musical performing arts* (classical musical concerts, opera, Spanish operetta and ballet, hereinafter MPA) using Bivariate Probit models. Notice that we compare live consumption with the online watching of performing arts, that is, we consider all the visual elements involved. Therefore, we compare cultural goods defined as similar as possible in these two alternative windows. Hence, we do not consider other uses of the Internet related to performing arts such as looking for information on theatres websites about tickets or schedules of performances. These models are estimated using data from the Survey of Cultural Habits and Practices (SCHP) conducted in Spain during 2014–2015.

Our paper extends the existing literature of cultural consumption in two ways. On the one hand, it studies the relation between restrictions to live cultural participation and digital engagement in cultural products. This could help to explore social inequality in the access to culture (O'Hagan, 1996; Van

Hek and Kraaykamp, 2013). On the other hand, it jointly addresses the determinants of *live* and *online* consumption of highbrow performing arts in a similar way that other papers have simultaneously analyzed online and onsite visits to museums (Mihelj et al., 2019, or Evrard and Krebs, 2018) or live and recorded popular music demands (Montoro-Pons and Cuadrado-García, 2011).

The remainder of the paper is structured as follows. After this introductory section we review the related literature in Section 2. Then, Section 3 describes the database and the methodology employed whereas Section 4 presents the results of our estimations. Lastly, Section 5 concludes.

2. LITERATURE REVIEW

2.1 Live cultural participation

There is a huge stream of the literature that has analyzed cultural participation from the perspective of economic behavior (Becker, 1996). Some studies have estimated demand functions for culture (Prieto-Rodríguez et al., 2005; Grisolia and Willis, 2012) whereas others have modelled the probability of attending to cultural activities (Gray, 2003).

One stylized finding is that income positively affects the demand for culture (Katsuura, 2008; Seaman, 2006). However, since performing arts are time-intensive, there is a trade-off between money and time. As a result, income increases are partially offset by a higher opportunity cost of time (Ekelund and Ritenour, 1999). In this sense, household type and labor status affect people's free time availability and their opportunities for live attendance.

Other of the most relevant factors affecting cultural consumption is the ability to appreciate it. The taste for cultural products is assumed to be cultivated through consumption, in line with the "learning-by-consuming" model developed by Lévy-Garboua and Montmarquette (1996). The more culture the people consumes, the more they enjoy it (McCain, 1979). According to the "rational addiction model" (Stigler and Becker, 1977), past consumption of cultural goods exerts a positive effect on current consumption. Apart from past experience, cultural goods usually require some prior skills, mainly in the form of educational background (Borgonovi, 2004). In this sense, education emerges as another important determinant of cultural participation (Seaman, 2006; Ateca-Amestoy, 2008; D'Angelo et al., 2010; Ateca-Amestoy and Prieto-Rodríguez, 2013; Willekens and Lievens, 2016; Castiglione, 2017; Hallmann et al., 2017; Suarez-Fernandez et al., 2019).

As for sociodemographic characteristics, the effect of age varies depending on the kind of cultural activities. On the one hand, painting, drawing, sculpture, photography and playing musical instruments normally decline with age (Cliff and Camic, 2015). Moreover, young people are more

prone to attend to popular events or going to the cinema (Katsuura, 2008). On the other hand, going to the theatre predominates among elderly people (Castiglione, 2011), while visiting museums or going to classical music concerts or ballet exhibit an inverted u-shape pattern (Falk and Katz-Gerro, 2016). Overall, highbrow culture is mainly consumed by the older generations (Eijck and Knulst, 2005). Regarding gender, men and women typically enjoy different amount of time for leisure (Mattingly and Bianchi, 2003) and display different preferences for culture. Females prefer highbrow cultural activities while males engage more in popular ones (Bihagen and Katz-Gerro, 2000). Concerning household composition, family responsibilities reduce time availability and, thus, cultural participation (Scherger, 2009).

2.2 Online participation

Online consumption has been explored from different perspectives. However, up to now, it is neither clear how it should be defined nor what kind of activities it should include. In this sense, the distinction between real consumption and merely information search is quite fuzzy (Hoffman, 2012). Moreover, online consumption depends on the specific social, political and cultural environment where it is analyzed (Calenda and Meijer, 2009; George, 2005).

Internet access is not universal. This leads to the so-called *digital divide*, which has been widely studied in the literature (Selwyn, 2004; Hargittai and Ginnant, 2008). There are two types of digital divide: i) first-order, which refers to the pure ICT (*Information and Communication Technology*) access, and ii) second-order, which pays attention to the inequality in the ability to use new technologies (Van Dijk, 2006). Nevertheless, first-order digital divide has almost disappeared over time. For example, in Spain about 86 percent of households have access to the Internet (INE, 2018). As for the second-order digital divide, scholars agree to note that this type of inequality is mainly related to human capital and sociodemographic characteristics (Van Deursen and Van Dijk, 2014; Van Deursen et al., 2015). Those who are better educated, urban residents and young people are more likely to master ICT use (Park et al., 2013). In line with this, web experience positively affects online participation (Gibson et al., 2005; Best and Krueger, 2005).

The role that the Internet plays in encouraging people to participate online in activities they do not engage offline has been a subject of research in different fields, especially in politics (Tolbert and McNeal, 2003; Boulianne, 2009). Compared to in-person participants, those who take part online tend to be more partisan and trust less in traditional media (Kaufhold et al., 2010). In general, previous findings suggest that online is a different kind of participation (Oser et al., 2013).

2.3 Online cultural participation

The mobilization thesis (Norris, 2001; Norris and Inglehart, 2009) argues that new technologies create more opportunities for social inclusion, which may favor equalization (Gibson et al., 2005). In the case of cultural goods, the Internet has opened up new venues for cultural participation, which may overcome the restrictions of in-person attendance to cultural events. In this sense, the Internet can be used as a tool for attracting new audiences by the performing arts enterprises. Ateca-Amestoy and Castiglione (2016) study the effect of the digital-divide on the online consumption of cultural activities in the UE. They find some significant differences in the effect that sociodemographic characteristics have on online consumption as compared to the corresponding ones on live participation, which opens a new opportunity for cultural managers to reach new cohorts of audience.

Nowadays, cultural firms and organization use their websites and social networks to promote their activities, trying to expand their cohorts of audience beyond the traditional consumer profile (O'Sullivan, 2007, Pinho and Macedo, 2008; Sashi, 2012). Turrini et al. (2012) examine the differences between theatre attendees that use the theatre's webpage and the general audience in Italy. They conclude that attendants who frequently use the website are more satisfied than those who do not because the online channel provides better access to information.

Cultural firms are starting to spread and market their products online. As a result, some cultural goods from distant locations are now accessible by the Internet. Live performances of opera, ballet, spoken theatre and orchestral concerts are becoming increasingly demanded online (Handke et al., 2017)².

A major concern for cultural firms is whether online cultural consumption would decrease in-person participation (Thomson et al., 2013). In this sense, the literature has paid attention to whether the online consumption of cultural contents would draw people away from face-to-face interaction. Bakhshi and Throsby (2014) analyze whether watching a theatre play on the cinema can substitute or complement in-person demand. They find a complementary pattern between online and live consumption. Nguyen et al. (2014) study the relation among consuming music in streaming, CD sales and concerts attendance for international, classical and local music in France. Their results show that listening to music online (streaming) does not affect CD sales but increases international-music concerts attendance.

As for the specific relationship between online and live participation in the arts, the literature is scarce. Chen (2015) investigates whether mobile cultural participation helps cultural organizations to reach broader audience cohorts more than in-person cultural participation. Her study concludes that mobile cultural participation helps members of disadvantaged groups having a more accessible venue for

² The Metropolitan Opera has been offering live performances in cinemas since 2006, increasing their popularity. Nonetheless, it took several years before it broke even (Bakhshi and Throsby, 2010).

participating in the arts. Additionally, her results show that mobile and in-person cultural participation are positively related, and that mobile cultural participation decreases with age but increases with education. Ateca-Amestoy and Castiglione (2016) found a positive effect for education regarding online highbrow musical performing arts consumption but not for lowbrow music or theatre. They also found a positive income effect for online consumption of low and highbrow music, but not for other performing arts.

3. DATA AND METHODOLOGY

3.1 Database

We use as database the Survey of Cultural Habits and Practices (SCHP) in Spain, conducted by the Spanish Ministry of Culture and Sports. This survey covers the most significant parts of cultural consumption, such as performing arts, cinema, music, theatre or museums. Our data sample gathers information from 2014 to 2015. In each quarter of the two years, a random sample was interviewed, which resulted in a cross-section structure with a total of 15,154 respondents. The final sample is representative of the Spanish population in terms of education level, employment status, family responsibilities and region of residence. This database is the most suitable for our purposes as it includes information regarding both live attendance and online participation in the highbrow performing arts.

During the scrutiny, respondents were surveyed about their *live* and *online* participation in the highbrow performing arts. Specifically, they were asked the following question: “*Have you attended any live arts’ performance within the last three months?*”. The performances considered are the theatre, ballet, opera, Spanish operetta (zarzuela) and classical musical concerts. We decided not to include popular music concerts since we are interested in the participation in highbrow performing arts. Another reason for this decision is that the profile of the consumer is quite different for popular music concerts compared to the highbrow performing arts. Regarding online consumption, individuals answered to the following question: “*Have you watched an arts’ performance through the Internet in the last year?*”, which is our measure for online cultural consumption. As already pointed, given this question, we can compare live consumption with the online watching of performing arts, that is, we compare similar cultural consumptions in two alternative channels. Whether the online content was free, or people had to pay for it was not addressed in the survey.

It is important to note that, for our main analysis, we divided live and online performing arts consumption in two different categories: *theatre* and *musical performing arts*, gathering the latter the

consumption of *ballet*, *opera*, *Spanish operetta* and *classical music concerts*. There is an essential reason that justifies this decision: the online consumption of these two groups of performing arts is different by definition. Ballet, opera, Spanish operetta and classic music concerts are types of musical performances that can be split in different pieces; thus, they can be enjoyed separately. Distinguishing theatre from musical performing arts (hereafter MPA) allows us to consider the fact that when individuals desire to enjoy a theatre play online, as its meaning is complete, they would usually watch it fully, as it would happen with films. On the contrary, when enjoying MPA, individuals might watch online just one piece of it (i.e. enjoying just one aria of a full opera). This implies that the time availability needed for the consumption of these two categories of the performing arts is completely different. For instance, while watching a full theatre play might request about two hours, watching one part of your favorite ballet can be done in less than ten minutes.

According to their way of consuming culture, we can classify individuals in four groups. First, individuals who consume both live and online culture, call it omnivores. Second, those who attend live performing arts, but do not join online, call it traditionalists. Third, a group of people who only watch performing arts through the Internet, call it *techys*. Lastly, there is a group of individuals who do not consume live neither online art performances, which we label as non-participants. A summary of the number of survey respondents conveyed on each category is provided in Table 1.

Table 1. Live and online consumption

		Theatre			Musical performing arts				
		Online			Online				
		0	1	Total					
Live	0	13,423	255	13,678	Live	0	13,702	434	14,136
	1	1,391	85	1,476		1	492	526	1,018
Total		14,814	340	15,154	Total		14,194	960	15,154

Examining the data provided in Table 1, we can see that the 88.6 and 90.5 per cent of the population are non-participants, namely, people who do not consume theatre or MPA, respectively³. As expected, as we request the viewing of the concert or play for online consumption, live attendance to the performing arts is higher than online participation in both cases, so the most frequent consumer of culture is the traditionalist. Nonetheless, this highlights the large difference in live and online theatre consumption, being the former (9.8 per cent) almost five times the latter (2.2 per cent). In contrast, the proportion of traditionalists and *techys* engaged in MPA is quite similar (6.7 and 6.3 per cent,

³ We are aware of the potential zero-inflation problem of our database. In order to contrast the robustness of our empirical estimations, the further analysis has been conducted for both the full sample and for an alternative database in which those individuals who are broadly categorized as no-consumers of cultural products have been removed. Results for the reduced sample were consistent with the ones in the complete model. Further information about the alternative sampling results is disposable under request.

respectively). With regard to the simultaneous consumption of both groups of performing arts, just a 2.3 per cent attend both live theatre and live musical performing arts, whereas less than 0.5 per cent consumes both online.

3.2 Methodology

For estimating both online and live performing arts consumption, we propose a Bivariate Probit model. Since the explanatory variables in both equations are not the same (see below), we specifically estimate a Seemingly Unrelated Bivariate Probit Regression Model (hereafter SUR-Biprobit). This model allows us to estimate both decisions simultaneously allowing the error terms to be correlated (Greene, 2012). The model is specified as follows:

$$\begin{aligned} Y_1^* &= X'\beta + \varepsilon_1 & Y_1 &= 1 \text{ if } Y_1^* > 0, Y_1 = 0 \text{ otherwise} \\ Y_2^* &= Z_i'\gamma + \varepsilon_2 & Y_2 &= 1 \text{ if } Y_2^* > 0, Y_2 = 0 \text{ otherwise} \end{aligned} \quad (1)$$

Where Y_1^* and Y_2^* are two latent variables for online and offline cultural participation, respectively, and ε_1 and ε_2 follow a bivariate normal distribution so that:

$$(\varepsilon_1, \varepsilon_2) \sim N(0, \Sigma) \quad \text{where } \Sigma = \begin{pmatrix} 1 & \rho \\ \rho & 1 \end{pmatrix} \quad (2)$$

The parameters can be easily estimated by Maximum Likelihood. The log likelihood function to be maximized is given by:

$$\text{Log L} = \sum_{i=1}^n \ln \Phi(q_1 X_i' \beta, q_2 X_i' \gamma, \rho), \quad (3)$$

$$\text{Being } \Phi(q_1 X_i' \beta, q_2 X_i' \gamma, \rho) = \int_{-\infty}^{X_i' \beta} \int_{-\infty}^{X_i' \gamma} \phi(z_1, z_2, \rho) dz_1, dz_2,$$

With $q_j = 1$ if $y_j = 1$ and $q_j = 0$ otherwise, for $j=1,2$.

This model collapses to two separate Probit models for Y_1 and Y_2 if $\rho=0$ (Cameron and Trivedi, 2012). The reader is referred to Greene (2012) for further details about the estimation procedure.

3.3 Empirical model

As noted in the related literature, individuals' socioeconomic characteristics generally determine cultural participation (Falk and Katz-Gerro, 2016; Willekens and Lievens, 2016) and specifically,

theatre attendance (Lévy Garboua and Montmarquette, 1996; Ateca-Amestoy, 2008; Zieba, 2009; Werck and Heyndels, 2017) and performing arts attendance (Ateca-Amestoy and Prieto-Rodríguez, 2013). Consequently, people's sociodemographic factors are introduced as explanatory variables. Furthermore, previous research suggests that the consumption of live culture is mostly an urban experience due to the higher supply available in large cities (Cuadrado and Frasquet, 1999; Gray, 2003). Therefore, we need to control for the degree of urbanization and the regional area where the individual lives. Individuals' general interest in culture also play an important role in cultural participation, as noted by Borgonovi (2004) and Castiglione (2017). Additionally, it is worth to examine if cultural consumption differs depending on the type of internet user (Chen, 2015; Ateca-Amestoy and Castiglione, 2016).

Formally, we estimate the following equation to analyze live cultural consumption:

$$\Pr(\text{Live consumption}_{ij} = 1) = f(Csoc_{ij}, Cgeo_{ij}, Cult_{ij}, Int_{ij})$$

Where the dependent variable, *Live consumption_{ij}*, is a dummy variable that takes value one when the individual *i* declares a positive attendance to the activity *j* within the last three months and value zero otherwise. The consumption of theatre and other performing arts is assumed to depend on the following independent variables.

First, we include a set of sociodemographic characteristics (*Csoc_{ij}*). It comprises gender, age (both linearly and in a squared form allowing for further flexibility), a dummy variable for having children at home (*Children on charge*), the overall number of people living at home (*Household members*) and a dummy for those married (*Married*) with respect to other possibilities (singles, widowed...). We also introduce dummy variables for labor status: employed, unemployed, retired and student, being disabled or inactive the reference category. As for the education level, we include a set of dummy variables that take value one when the individual has completed secondary or tertiary education, being primary education or lower the reference category.

Second, we consider population size⁴ and a set of regional dummies (one for each county of Spain) as controls for geographical features (*Cgeo_{ij}*).

Third, overall people's interest in culture (*Cult_{ij}*). It includes:

⁴ Specifically, we include three dummy variables for three population sizes (less than 10.000 habitants, between 10.001 and 50.000 and between 50.001 and 100.000), being the one for more than 100.001 habitants the reference category.

- i. *Cultural interest*, which measures individuals' interest in cultural goods. This variable is constructed as an indicator of self-declared interest in the following cultural activities: reading, going to the cinema, visiting monuments, museums and listening to music. Interest in each activity is measured in a scale from zero (not interested at all) to ten (highly interested). Since we aggregated interest in the five activities, *Cultural interest* is a count variable that ranks from 0 to 50.
- ii. *Physical cultural capital*, which is the result of a Principal Component Analysis (PCA) of several variables including the number of books, number of e-books, DVD/CD/Blu Ray's player for listening to music, number of musical instruments, digital DVD/CD/Blu Ray audiovisual player, digital video player, and other devices.
- iii. *Informatic equipment*, is another PCA of variables related to the availability of the Internet and informatic equipment, including number of computers, CD/DVD/Blue Ray player, CD/DVD/Blue Ray recorder, external hard multimedia disc, videogame software, educative software, other software, tablet, broadband Internet access, Internet access on the mobile phone, PDA, videogame console and smartphone. Further information about both PCA variables is disposable under request. Physical cultural capital at home and informatic equipment can be considered as proxies of individuals' wealth, since they are both highly correlated with households' income (see Fernandez-Blanco et al., 2017).⁵

Lastly, differences among Internet users (Int_{ij}) could also affect the type of cultural consumption. To examine this issue, we include *Social networks* as a dummy variable which takes value one when the individual declares using chats or social networks when he/she is connected to the internet, and zero otherwise. Additionally, we consider *Professional user*, which is a dummy for those who use the Internet for professional purposes. To control for the first-order digital divide we include *Internet* which is a variable that takes value one when the individual uses internet every day.

The corresponding equation for explaining online cultural consumption is given by:

$$\Pr(\text{Online consumption}_{ij}) = f(Csoc_{ij}, Cgeo_{ij}, Cult_{ij}, Int_{ij}, Res_{ij})$$

Where the dependent variable $\text{Online consumption}_{ij}$ measures cultural consumption through the Internet for each individual i to the activity j , during the last year. It is a dummy variable that takes value one when the individual i declares a positive online consumption of the cultural activity j and value zero otherwise.

⁵ Both PCA analysis are available upon request.

Online consumption is explained by the same variables presented above without *Internet*, in order to avoid potential endogeneity problems. Additionally, restrictions to live attendance are considered.

Within the survey, individuals answered the following question: *which is the main reason why you had not attended more frequently to the theatre / MPA?* Individuals could choose different options from a choice set⁶. In the regression, we grouped the options in *high price*, *supply constraints* (difficulty to get tickets, scarcity of supply and not enough information) and *lack of interest* (preference for television, video or the internet, it is difficult to understand, lack of time, lack of interest). In the case of theatre attendance, all of them are defined as dummy variables, being the remaining possible choices the omitted category. For other MPA, we aggregated the responses for each activity (ballet, opera, Spanish operetta and classical music concerts), so this variable ranks from 0 to 4. We argue that self-declared constraints to *live* attendance to the performing arts could explain *online* cultural consumption. For instance, not attending more often the theatre because of supply constraints regarding the place of residence can prompt to watching a play online.

Descriptive statistics of the variables are outlined in Table 2. Column (1) shows statistics for the full sample, whereas columns (2) and (3) provide statistics for each sub-population (those who consume theatre or MPA, either live or online). It can be drawn from Table 2 that while the traditional profile of cultural consumer (live attendant) is a highly educated woman in her fifties (Bihagen and Katz-Gerro, 2000), the online consumer is a man five years younger and slightly less educated. This type of individual fits more in the typical profile of an Internet user. However, this profile is not equal for theatre and MPA, giving support to the decision to analyze them separately. Also, singles and those who use the internet daily consume more culture online.

⁶ The choice set was the following: (1) high price, (2) it is difficult to get tickets, (3) scarcity of supply, (4) not enough information, (5) preference for television, (6) video or the Internet, (7) it is difficult to understand, (8) lack of time, (9) lack of interest, (10) lack of company.

Table 2. Descriptive statistics

Variable	Description	Full	Theatre		MPA	
		sample (1)	Live (2)	Online (3)	Live (4)	Online (5)
		Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Female	Takes value one if respondent is a female	0.513 (0.500)	0.580 (0.494)	0.468 (0.500)	0.585 (0.493)	0.524 (0.500)
Male	Takes value one if respondent is a male	0.487 (0.500)	0.420 (0.494)	0.532 (0.500)	0.415 (0.493)	0.476 (0.500)
Age	Age of the respondent	49.14 (18.83)	44.48 (16.35)	40.53 (16.28)	49.10 (17.38)	45.19 (16.79)
House members	Number of members living at home	3.056 (1.354)	3.059 (1.183)	3.200 (1.203)	3.077 (1.360)	3.127 (1.284)
Children on charge	Takes value one when children living at home	0.223 (0.417)	0.249 (0.432)	0.209 (0.407)	0.243 (0.429)	0.255 (0.436)
Married	Takes value one if individual is married	0.602 (0.490)	0.597 (0.491)	0.506 (0.501)	0.626 (0.484)	0.576 (0.494)
Single	Takes value one if individual is single	0.364 (0.481)	0.384 (0.487)	0.462 (0.499)	0.350 (0.477)	0.401 (0.490)
Other marital status	Takes value one if widowed, separated or divorced	0.035 (0.183)	0.019 (0.136)	0.032 (0.177)	0.025 (0.155)	0.023 (0.150)
Primary	Takes value one if highest education level of the individual is primary education or lower	0.184 (0.388)	0.070 (0.255)	0.053 (0.224)	0.087 (0.283)	0.078 (0.269)
Secondary	Takes value one if highest education level of the individual is secondary education	0.473 (0.499)	0.353 (0.478)	0.459 (0.499)	0.387 (0.487)	0.394 (0.489)
Vocational	Takes value one if highest education level of the individual is vocational education	0.149 (0.356)	0.177 (0.382)	0.159 (0.366)	0.134 (0.340)	0.147 (0.354)
University	Takes value one if highest education level of the individual is tertiary education	0.194 (0.395)	0.400 (0.490)	0.329 (0.471)	0.392 (0.488)	0.381 (0.486)
Employed	Takes value one if individual is either self-employed or employees	0.448 (0.497)	0.545 (0.498)	0.497 (0.501)	0.491 (0.500)	0.506 (0.500)
Unemployed	Takes value one if individual is unemployed	0.143 (0.350)	0.114 (0.319)	0.159 (0.366)	0.102 (0.303)	0.121 (0.326)
Retired	Takes value one if individual is retired	0.209 (0.406)	0.129 (0.335)	0.085 (0.280)	0.209 (0.407)	0.157 (0.364)
Student	Takes value one if individual is a student	0.092 (0.290)	0.146 (0.353)	0.206 (0.405)	0.111 (0.314)	0.147 (0.354)
Disabled	Takes value one if individual is disabled	0.009 (0.093)	0.005 (0.069)	0.009 (0.094)	0.004 (0.063)	0.010 (0.102)
Other status	Takes value one if individual is housewife, househusband, inactive...	0.008 (0.091)	0.006 (0.078)	0.006 (0.077)	0.006 (0.077)	0.006 (0.079)
Cultural interest	Sum of declared interest in reading, cinema, visiting monuments, museums and listening to music	30.173 (11.008)	37.211 (7.761)	36.832 (7.358)	37.166 (8.232)	37.394 (7.910)
Practices	Dummy for individuals doing 4 or more of the following cultural practices: writing, painting, pottery, photos, video, web editing, audiovisual design	0.042 (0.201)	0.089 (0.284)	0.176 (0.382)	0.099 (0.299)	0.125 (0.331)
Social networks	Dummy for individuals using social networks (such as Facebook, Twitter...)	0.353 (0.478)	0.478 (0.500)	0.488 (0.501)	0.403 (0.491)	0.440 (0.497)
Professional user	Dummy for individuals using the Internet for professional purposes	0.292 (0.455)	0.492 (0.500)	0.494 (0.501)	0.466 (0.499)	0.490 (0.500)
Internet	Dummy if individual uses the Internet every day	0.520 (0.500)	0.747 (0.435)	0.812 (0.391)	0.678 (0.468)	0.768 (0.423)
MPA Price	Main declared non-attendance reason: high price	1.053 (1.544)	1.415 (1.640)	1.479 (1.648)	1.544 (1.651)	1.531 (1.651)
MPA Supply	Main declared non-attendance reason: it is difficult to get tickets, scarcity of supply, little information	0.898 (1.424)	1.121 (1.509)	1.153 (1.427)	1.307 (1.539)	1.181 (1.497)
MPA Interest	Main declared non-attendance reason: preference for television, video or the Internet, it is difficult to understand, lack of time, lack of interest	0.634 (1.253)	0.470 (1.047)	0.374 (0.861)	0.331 (0.808)	0.354 (0.820)
Theatre Price	Main declared non-attendance reason: high price	0.366 (0.482)	0.503 (0.500)	0.526 (0.500)	0.470 (0.499)	0.453 (0.498)
Theatre Supply	Main declared non-attendance reason: it is difficult to get tickets, scarcity of supply, little information	0.255 (0.436)	0.323 (0.468)	0.274 (0.446)	0.324 (0.468)	0.305 (0.461)
Theatre Interest	Main declared non-attendance reason: preference for television, video or the Internet, it is difficult to understand, lack of time, lack of interest	0.090 (0.286)	0.020 (0.139)	0.021 (0.142)	0.031 (0.175)	0.036 (0.188)
Observations		15,154	1,476	340	1,018	960

4. RESULTS

Table 3 presents the estimates of the SUR-Biprobit model for theatre and MPA participation, both live and online⁷. The ρ parameter, which accounts for the tetrachoric correlation between the error terms of the two equations, is positive and statistically different from zero. This justifies our decision to jointly explain both decisions, as they are interdependent. This positive correlation indicates that there is a complementarity effect between live and online culture consumption. This complementarity is a possible signal of how online contents and its accessibility are desirable facilitators of access to highbrow culture. This has been the most popular and optimistic view of the role of the Internet regarding culture consumption (Nguyen et al., 2014; Bakhshi and Throsby, 2014; and Chen, 2015). However, the online channel could just enable the persistence of the current inequalities in highbrow cultural consumption between socioeconomic groups, if the observed complementarity is due mainly to transfers of traditional consumers to omnivores, in line with Mihelj et al. (2019).

Starting with the sociodemographic features, males display lower probability of attending theatre plays and MPA than females, which is consistent with previous research. There are significant gender differences in cultural participation, especially in highbrow (Bihagen and Katz-Gerro, 2000; Ateca-Amestoy, 2008; Castiglione, 2017). However, we find no gender differences in online consumption of MPA, contrary to Ateca-Amestoy and Castiglione (2016). On the other hand, the probability of in-person attendance and online consumption of MPA increase with *Age*, but in a decreasing rate according to the negative sign of the squared term. This result is in line with Castiglione (2017). As for theatre consumption, *Age* is not statistically significant to explain neither in-person nor online participation. The number of household members (*House members*) only exerts a negative effect on the probability of attending the theatre, being non-significant for the rest of cases. Concerning having children at home (*Children on charge*) or the civil status (*Married*), these variables are not significant in neither of the four equations.

With reference to the education level, in comparison to those with primary studies (omitted category), highly educated ones (*University*) show higher probability of live participation in both theatre and MPA. This follows the findings of Borgonovi (2004), D'Angelo et al. (2010) and Castiglione (2017). Likewise, when labor status is regarded, retired people display a higher preference for MPA in comparison to housewives (baseline category), whereas students appear to be highly interested in theatre attendance. A possible explanation may rely on differences in time availabilities. What is more, it is

⁷ Since opera and Spanish operetta are theatrical expressions with a story line, it could be arguable whether it would be better to group opera and Spanish operetta with theatre, and ballet and MPA alone. To examine whether our results change depending on the grouping of the different performing arts, we estimate the same model with this alternative classification. Given that results are pretty similar; we keep the prior grouping in the paper. The parameter estimates of the alternative grouping can be found in the appendix.

important to note that education level and labor status may also control for income disparities across consumers.

Concerning the effect of using the Internet, in line with Chen (2015), results show that those who daily surf the Internet exhibit higher likelihood of attending theatre plays but not musical performing arts. However, the professional use of the Internet is positively associated to in-person attendance to both theatre and performing arts. Moreover, this variable also exerts a positive impact on the probability of online MPA consumption, but we do not observe a significant impact on online theatre demand. These individuals might be white collars, so this variable may account for individuals' social class. On the contrary, the use of *Social networks* is not statistically significant.

Table 3. Results of the Bivariate Probit Estimation

	Theatre		Musical performing arts	
	Online	Live	Online	Live
Male	0.090*	-0.154***	0.033	-0.115***
	(0.051)	(0.032)	(0.037)	(0.036)
Age	-0.012	0.011*	0.017**	0.022***
	(0.011)	(0.006)	(0.008)	(0.007)
Age sq.	0.000	-0.000	-0.000**	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)
House members	-0.041*	-0.076***	-0.030*	-0.002
	(0.024)	(0.015)	(0.017)	(0.015)
Children on charge	-0.096	-0.022	0.040	0.006
	(0.072)	(0.043)	(0.049)	(0.047)
Married	-0.016	0.067	-0.086*	-0.009
	(0.073)	(0.041)	(0.047)	(0.043)
Secondary	0.136	-0.060	-0.051	0.027
	(0.106)	(0.057)	(0.066)	(0.062)
Vocational	0.079	0.123*	-0.072	0.014
	(0.121)	(0.066)	(0.077)	(0.075)
University	0.123	0.231***	0.092	0.233***
	(0.118)	(0.065)	(0.075)	(0.071)
Employed	-0.014	0.007	-0.125*	-0.089
	(0.117)	(0.064)	(0.076)	(0.070)
Unemployed	0.135	-0.030	-0.085	-0.103
	(0.124)	(0.073)	(0.083)	(0.081)
Retired	-0.038	0.106	0.201**	0.193**
	(0.136)	(0.077)	(0.084)	(0.076)
Student	0.127	0.406***	0.189*	0.289***
	(0.146)	(0.092)	(0.107)	(0.107)
Cultural interest	0.016***	0.027***	0.024***	0.027***
	(0.003)	(0.002)	(0.002)	(0.002)
Practices	0.486***	0.138**	0.368***	0.312***
	(0.080)	(0.063)	(0.064)	(0.066)
Social networks	-0.057	0.009	-0.069*	-0.029
	(0.055)	(0.035)	(0.040)	(0.039)
Professional user	0.088	0.102***	0.139***	0.174***
	(0.058)	(0.038)	(0.043)	(0.041)
Internet		0.092**		-0.026
		(0.041)		(0.039)
Physical cultural capital	0.162***	0.164***	0.187***	0.220***
	(0.049)	(0.031)	(0.037)	(0.029)
Physical cultural capital sq.	-0.019**	-0.013**	-0.013**	-0.015***
	(0.008)	(0.005)	(0.006)	(0.004)
Informatic equipment	0.242***	0.202***	0.263***	0.126***
	(0.047)	(0.028)	(0.031)	(0.030)
Informatic equipment sq.	-0.029	0.002	-0.017	-0.011
	(0.039)	(0.022)	(0.024)	(0.023)
High price	0.143**		0.036***	
	(0.066)		(0.012)	
Supply problems	0.146*		0.034***	
	(0.075)		(0.013)	
Lack of interest	-0.274*		-0.019	
	(0.153)		(0.016)	
Constant	-2.281***	-2.307***	-3.053***	-3.386***
	(0.332)	(0.210)	(0.265)	(0.247)
ρ		0.119***		0.779***
		(0.038)		(0.013)
<i>Log likelihood</i>		-5518.601		-5645.162
<i>AIC</i>		11215.200		11468.330
<i>BIC</i>		11893.920		12147.040
<i>Observations</i>		15,154		15,154

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The positive and significant effect of *physical cultural capital* at home and *informatic equipment* in the four equations is in line with previous findings (Fernández-Blanco et al., 2017). The positive effect of wealth on cultural participation is especially relevant considering that online consumption requires physical support, such as a computer, a tablet or a smartphone. Similarly, *cultural interest* has a significant and positive influence in all categories: more interest in culture leads to higher probability of consumption, as in Levy-Garboua and Montmarquette (1996), Borgonovi (2004) and Castiglione (2017), who find interest in other cultural activities positively associated with theatre and MPA consumption. The same explanation holds for the positive effect of cultural active *Practices*. Individuals highly involved in cultural activities are more prone to consume theatre and MPA than their peers, which is consistent with Borgonovi (2004).

Finally, we analyze the effects of the restrictions to in-person attendance in the online participation equation. *High price* has a positive and statistically significant effect in both theatre and MPA online engagement, suggesting that those who perceive live MPA to be too expensive substitute in-person attendance by online consumption. Consumers of live theatre and MPA have been shown to be price-elastic (Levy-Garboua and Montmarquette, 1996; Grisolia and Willis, 2015), so the online channel might be a cheaper way of consumption. The same pattern holds for the *supply constraints*, which positively affect online consumption. Those who declare that the scarcity of supply is their main reason for not attending more often to the theatre or to MPA display a higher probability of online cultural consumption. As for *lack of interest*, this variable is not statistically significant for the MPA and displays a negative effect for the theatre, which implies that those not interested in attending the theatre in-person do not consume it online either. Hence, those that would consume more under other more favorable circumstances of price or supply are using the Internet to consume what they would consume otherwise. Thus, online consumption is being used to soften constraints on live consumption. However, this may imply that some of the worries about the complementarity effect can be confirmed.⁸

To further explore the impacts of some independent variables on the online and live cultural participation, we compute their marginal effects on the four possible outcomes. We use the labels introduced in Section 3 (non-participants, traditionalists, *techys* and omnivores). Table 4 shows margins for theatre and MPA⁹.

⁸ Population size of the city and the region where each individual lives (NUTS 2) are also controlled for to account for further observable heterogeneity. Results are not discussed for the sake of brevity, but they are available upon request.

⁹ Since we estimate a SUR-Bivariate Probit in which the explanatory variables in the two equations are not the same, the computed marginal effects for the live attendance restrictions that only appear in the online

Starting with the sociodemographic characteristics, in both activities the marginal effect of being a male is positive for *techys* and non-participants and negative for traditionalists. This implies that women tend to consume the performing arts in-person whereas men prefer online consumption. In contrast, the marginal effect for the omnivores is not statistically different from zero. Therefore, gender does determine their likelihood of consuming culture through both channels simultaneously.

As for *Age*, young people are more likely to be non-participants in MPA, whereas the likelihood of being a traditionalist or an omnivore increases with age. Almost two thirds of this rise are related to the increase of traditional consumers and the remaining third to omnivores. However, we would expect a negative marginal effect of age on omnivores if young people, who use the Internet more often, would have found highbrow culture while surfing and would have continued to consume it. But we found the opposite, the older you are the higher the probability of being an omnivore. Hence, online access seems to be reinforcing existing consumption patterns, not attracting new consumers and, therefore, not helping to reduce cultural access inequality. Maybe because live theatre is much more popular than MPA and attracts people of different ages (probably to different kinds of plays), the type of theatre consumer is not related to age.

As regards *Professional user*, its marginal effect is similar for both activities. The use of the Internet to work, which may be related with being a white-collar, is positively associated with the likelihood of being a traditionalist or an omnivore, although it has no effect for *techys*. Again, as for *House members* marginal effect, traditional consumers and omnivores change in the same direction, supporting the idea that online access to highbrow culture is more probable among more privileged people that are already consuming live culture.

To summarize, whilst the sociodemographic consumer profile of the traditional attendant is mainly a woman in her fifties, the *techys* and omnivores segments clearly differ. This result is the keystone that puts on risk the notion of the Internet as a democratization tool for cultural participation.

Finally, the marginal effect of declaring high price as the main limitation for further in-person attendance on the probability of online consumption is higher for those who already attend than for those who do not. The effect is also stronger for MPA than theatre. Exactly the same pattern holds for the *supply constraints* variable, although it is significant at 10 percent level for theatre. Therefore, again, online culture seems to be an attractive option, mainly for those who already consume live highbrow culture, to access it in an easier and cheaper way. Probably, many former traditional

Participation equation are the conditional ones, namely, the marginal probability of being an online consumer conditional on being/not being a live cultural consumer.

consumers are moving to the omnivore group as to take advantage of the new online opportunities to consume highbrow culture.

As for *lack of interest*, this variable exerts a strong negative effect on online theatre and MPA consumption, no matter whether the individual is currently attending them live or not (also at 10 percent significance level). Put it in another way, a rise in cultural interest will increase online demand, especially among live consumers.

It is worthwhile to pay attention to the similarities and differences between different consumers of the performing arts. Consequently, we now examine the correlation between the predicted probabilities of being each type of consumer for both equations. Results are depicted in Table 5.

First of all, there is a clear and significant link between the same type of consumer in both activities (see the main diagonal of the table). There is a high correlation between omnivores in theatre and in the MPA. We interpret it as a similarity among consumers, regardless the type of culture they consume. Also, traditional consumers of MPA display the lowest correlation with *techys* and omnivores in theatre (0.258 and 0.384, respectively). This suggests that the format of each type of culture affects its consumption. In the case of theatre, a play is created to be watched as a whole. Therefore, it seems plausible that online consumption is easier for MPA, which can be divided into arias, than for theatre plays. Accordingly, people who are traditional MPA consumers, but do not watch it online, might be “purist” consumers who only resemble traditionalists from theatre. The correlation among *techys* and omnivores of MPA with theatre consumers is also higher than for the traditionalist, which supports our idea of the “purist” consumer.

Regarding theatre consumers, some relevant differences with MPA emerge. First, traditionalists are highly correlated with all type of MPA consumer, especially with omnivores (0.877). *Techys* in theatre show a positive correlation with MPA omnivores of 0.598, which is in the middle between correlation with traditionalists (0.258) and with *techys* (0.807). As expected, individuals who watch theatre online would watch MPA online easily, probably because of their different formats. Since they are not interested in attending the theatre in-person, they may not be interested in attending the MPA either. Besides, it is worthy to note that the relationship between traditionalists and omnivores is higher than the relation between traditionalists and *techys*. This last result reinforces the hint about the effect of complementarity. Traditionalists are more similar to omnivores than to *techys*, presumably because omnivores are the “new” traditionalists in the Internet era.

Table 4. Marginal effects (in percentage).

	Theatre				Musical performing arts			
	Non-participants	Traditionalists	Techys	Omnivores	Non-participants	Traditionalists	Techys	Omnivores
Male	1.859***	-2.289***	0.429**	-0.007	0.696***	-1.046***	0.620**	0.270
Age	-0.013	0.033	-0.016	-0.002	-0.092***	0.060***	-0.007	0.039***
House members	1.230***	-1.040***	-0.098	-0.092***	0.230	0.090	-0.208	-0.112
Professional user	-1.763***	1.350***	0.254	0.158**	-2.406***	0.919***	0.412	1.073***
	P(online live=0)		P(online live=1)		P(online live=0)		P(online live=1)	
High price	0.630**		0.933**		0.287***		1.836***	
Supply constraints	0.640*		0.949*		0.273***		1.746***	
Lack of interest	-1.203*		-1.782*		-0.154		-0.988	

Table 5. Correlation between predicted probabilities.

		Theatre			
		Non-participants	Traditionalists	Techys	Omnivores
Musical performing arts	Non-participants	0.901	-0.887	-0.628	-0.735
	Traditionalists	-0.672	0.735	0.258	0.384
	Techys	-0.833	0.757	0.807	0.746
	Omnivores	-0.869	0.848	0.598	0.772

5. CONCLUSIONS

In this paper, we examine the inter-relationships between live and online consumption of highbrow performing arts in the current context of rapidly changing information and communications technologies. We also analyze whether online cultural consumption could be a way of limiting the effects of the constraints on live cultural participation. In doing so, we simultaneously analyze the determinants of live and online consumption of theatre and musical performing arts (MPA). The empirical model involves the estimation of two SUR-Bivariate Probits using the Survey on Cultural Habits and Practices (SCHP) collected by the Spanish Ministry of Culture and Sports for the period 2014-2015.

One of the principal takeaways from this research is that those who declare that their main restriction to live cultural attendance is either high prices or supply constraints display a higher probability of online consumption. Additionally, the marginal effects of high price and supply constraints are much larger when individuals are in-person consumers. Moreover, these constraints appear to be quite more important in the case of the MPA than in the theatre. This may suggest that high prices and supply constraints limit in-person cultural consumers' demand, leading them to complement it with online consumption, especially for the MPA case. Consequently, it seems that unsatisfied demand for live consumption, mainly by people that is already consuming highbrow culture, can be partially offset by the online channel. This result may be seen as a positive outcome of the online availability of cultural contents. However, if this effect is concentrated on current consumers of live highbrow performing arts, it may be the case that these online resources may not help to spread these culture expressions to new audiences. Then, omnivores would be former traditional consumers but not so *techys*.

Another relevant result, probably related with the social dimension of live performing arts attendance, is that sociodemographic features are much more important for explaining the likelihood of being a live assistant than for online consumers. Whereas age, gender, educational achievements and labor status are really helpful in explaining who the live attendees are, these variables are less relevant for characterizing online consumers. This implies that the well-known traditional average live participant profile (highly educated woman in her fifties) does not represent at all the online consumer archetype of performing arts.

We find that online and live cultural participation are mainly complements, with a different magnitude of this effect for each group of performing arts that we have considered. Whilst MPA consumers are more prone to combine the two channels, theatre ones appear to be more reluctant to watch a play

online.³³ This issue can be explained by the fact that MPA can be more easily partitioned and enjoyed in smaller bits (for instance, an aria or a musical), whereas theatre plays have a complete meaning, as it happens with films, which make more difficult their partial consumption. We must be aware that this complementary effect could be a factor that will keep or increase existing inequalities in attendance between socioeconomic groups. Hence, online access, instead of democratizing cultural participation, could reinforce existing consumption patterns if this complementary effect is mainly capturing transfers of traditional consumers to omnivores without helping to increase cultural participation among more deprived groups.

Our results have several policy implications for performing cultural managers. Probably the most important one is that they could benefit from online advertising campaigns of their live cultural products. First, they can try to communicate to the online consumers that supply and price constraints, which are the main restrictions of live consumption that online consumers try to overcome, are less important than they might think (e.g. promoting last minute policies, new productions...). This could be even more important for MPA since it displays a higher marginal effect for these two types of live consumption constraints. Similar mechanisms could be used to attract new public to the theatres, especially from younger cohorts, since there are many online consumers that do not fit into the average profile of live attendants. Adverts could emphasize aspirational elements of the live cultural consumption, but also the improvements in the experienced quality of live attendance.

Additionally, policy makers must be aware that online culture could be an option attractive to those that already consume culture, facilitating its access in an easier and cheaper way, but not attracting new consumers and, therefore, reproducing the old patterns of inequality in cultural access. A necessary condition to deny this possibility is to take the digital divide down to zero. The first-order digital divide has almost disappeared over time in the Western countries but could still be relevant in other countries. Some additional efforts should be done by authorities in order to reduce the second-order digital divide related to cultural consumption. As it happens with live highbrow culture participation, education has to be a key element of any cultural policy to overcome the second-order digital cultural divide. Once the digital divide would be reduced, high-brow culture democratization could be a realistic aim of the public culture policy. In that case, linking public subsidies to fund live productions to the condition of making it available on the Internet under certain conditions could be a good idea.

³³ This could be a piece of evidence in favor our classification of the performing arts in two different groups: theatre and musical performing arts.

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ANNEX

Alternative grouping of the highbrow performing arts results

	Bivariate Probit Model			
	Theatre, opera and Spanish operetta		Ballet and classical concerts	
	Online	Live	Online	Live
Male	0.143*** (0.046)	-0.171*** (0.032)	0.018 (0.038)	-0.113*** (0.037)
Age	-0.009 (0.010)	0.010 (0.006)	0.020** (0.008)	0.026*** (0.007)
Age sq.	0.000 (0.000)	-0.000 (0.000)	-0.000** (0.000)	-0.000*** (0.000)
House members	-0.032 (0.021)	-0.063*** (0.015)	-0.030* (0.018)	-0.013 (0.016)
Children on charge	-0.066 (0.063)	-0.034 (0.043)	0.047 (0.051)	0.044 (0.049)
Married	-0.071 (0.062)	0.056 (0.040)	-0.099** (0.049)	-0.042 (0.044)
Secondary	0.128 (0.093)	-0.020 (0.056)	-0.053 (0.068)	0.004 (0.064)
Vocational	0.046 (0.106)	0.153** (0.066)	-0.093 (0.080)	-0.025 (0.078)
University	0.184* (0.103)	0.278*** (0.064)	0.052 (0.077)	0.193*** (0.074)
Employed	-0.110 (0.099)	-0.009 (0.063)	-0.063 (0.080)	-0.122* (0.071)
Unemployed	0.010 (0.106)	-0.053 (0.072)	-0.061 (0.088)	-0.126 (0.083)
Retired	-0.067 (0.109)	0.133* (0.074)	0.241*** (0.089)	0.170** (0.078)
Student	0.041 (0.128)	0.376*** (0.090)	0.239** (0.112)	0.284*** (0.109)
Cultural interest	0.023*** (0.003)	0.027*** (0.002)	0.022*** (0.002)	0.028*** (0.002)
Practices	0.462*** (0.073)	0.142** (0.062)	0.380*** (0.066)	0.326*** (0.067)
Social networks	-0.066 (0.049)	0.011 (0.035)	-0.062 (0.041)	-0.013 (0.040)
Professional user	0.108** (0.053)	0.128*** (0.037)	0.135*** (0.045)	0.150*** (0.042)
Internet		0.105*** (0.040)		-0.025 (0.039)
Physical cultural capital	0.093** (0.041)	0.178*** (0.032)	0.264*** (0.037)	0.226*** (0.037)
Physical cultural capital sq.	-0.004 (0.006)	-0.015*** (0.005)	-0.032*** (0.006)	-0.019*** (0.007)
Informatic equipment	0.324*** (0.041)	0.193*** (0.028)	0.239*** (0.032)	0.120*** (0.031)
Informatic equipment sq.	-0.036 (0.034)	-0.001 (0.021)	-0.015 (0.025)	-0.011 (0.023)
High price	0.089*** (0.021)		0.090*** (0.024)	
Supply problems	0.097*** (0.023)		0.080*** (0.026)	
Lack of interest	-0.057* (0.033)		-0.099*** (0.038)	
Constant	-2.775*** (0.305)	-2.363*** (0.208)	-3.039*** (0.275)	-3.399*** (0.256)
ρ		0.0711** (0.034)		0.814*** (0.012)
<i>Log likelihood</i>		-6162.06		-5141.97
<i>AIC</i>		12502.12		10461.94
<i>BIC</i>		13180.84		11140.66
<i>Observations</i>		15,154		15,154

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

CONCLUSIONES

El consumo cultural ha sido analizado por numerosos autores a lo largo del tiempo. Una de las más consolidadas ramas de estudio se centra en el estudio de temas relacionados con la participación cultural y la no asistencia a las actividades culturales desde múltiples perspectivas. En la literatura sobre participación cultural, se ha tratado de explicar qué determina el consumo cultural y cómo aumentar la asistencia a las actividades culturales entre el público. La proporción de la población que no consume cultura regularmente, o que no consume ningún tipo de cultura, sigue siendo un tema de preocupación importante, especialmente en los países desarrollados. En este contexto, esta tesis doctoral estudia el perfil de los consumidores culturales, explorando los principales límites de la participación e investigando cómo impulsar el consumo cultural superando esos límites. Más concretamente, los capítulos 1 y 2 se centran en determinar los límites de asistencia, mientras que los capítulos 3 y 4 tienen como objetivo estudiar cómo incrementar la participación cultural.

En el Capítulo 1 de esta tesis, estudiamos las principales razones por las cuales las personas no asisten con mayor frecuencia a conciertos de música contemporánea y al cine. Nuestro principal hallazgo es que la falta de interés actúa como el principal límite para el consumo cultural. Aunque unos precios excesivos también son un problema para la participación, nuestros resultados sugieren que las restricciones económicas no son el mayor problema. Por ello, sugerimos que sería más adecuado centrar las políticas culturales en aumentar el interés por los bienes culturales en lugar de subsidiar los precios. Partiendo del hecho de que la falta de interés está relacionada con el papel de las preferencias individuales, y dado que la educación superior es un determinante clave en el consumo cultural, unas políticas educativas a largo plazo enfocadas en incrementar el interés por los productos culturales parecen ser la forma más eficiente de incrementar la participación cultural.

El Capítulo 2 analizamos las importantes disparidades encontradas entre los principales motivos declarados de no participación cultural en dos oleadas sucesivas de una encuesta de opinión española, la Encuesta de Hábitos y Prácticas Culturales 2010-11 y 2014-15. El objetivo de este capítulo es comprender cómo el cambio del IVA cultural que tuvo lugar en España en 2012 afectó al consumo cinematográfico. Antes de la subida de impuestos, las principales razones declaradas como explicativas de que no se asista con mayor frecuencia al cine fueron la falta de interés, la falta de tiempo y los precios (30, 30 y 27 por ciento de las respuestas, respectivamente). Después del cambio

impositivo, más de dos tercios de los encuestados declararon que la principal razón por la que no asistían más al cine era que el precio es alto. Sin embargo, estas declaraciones sobre los precios no fueron consistentes con el consumo de cine, cuya frecuencia asistencia media se mantuvo estable antes y después del cambio del IVA cultural. Analizando la participación en el cine, encontramos que, curiosamente, las respuestas a preguntas de opinión o evaluación (preguntas subjetivas) probablemente estén sesgadas (intencionalmente o no) mientras que las respuestas sobre el comportamiento (objetivo) son más fiables.

A partir de los resultados obtenidos en los capítulos 1 y 2, parece que la falta de interés, en primer lugar, y precios altos, en segundo lugar, son los dos límites clave de la participación cultural. Dado que la demanda de cultura está determinada por procesos de experiencia, en los que las personas desarrollan su gusto por la cultura a través del consumo (como se explica en los modelos de aprendizaje mediante el consumo y adicción racional), el problema de la falta de interés en la cultura probablemente esté relacionado con la falta de conocimiento y comprensión del arte. Esto, a su vez, está estrechamente relacionado con la educación. Con el fin de tratar de descubrir cómo superar este límite a la participación en actividades culturales, el Capítulo 3 explora las particularidades de la educación como límite al consumo de cultura.

El nivel educativo es la característica individual con mayor impacto en el consumo de cultura. Primero, porque la educación superior conduce a un mayor interés por la cultura y, segundo, porque cuanto mayor es el nivel de educación, mayores son los ingresos esperados, y las rentas altas también se relacionan con una asistencia a actividades culturales más frecuente. En el Capítulo 3, analizamos el efecto de la educación en la asistencia al cine, las artes escénicas y las visitas a sitios de interés cultural. Encontramos que el efecto de la educación cambia entre actividades, siendo su efecto marginal mayor en las actividades de alta cultura que en la cultura popular. Sin embargo, dado un cierto nivel de educación, mayores ingresos aumentan la asistencia al cine más que a teatros o museos. Probablemente esto esté relacionado con una particularidad del consumo de alta cultura, y es que éste lleva asociada la comprensión de elementos simbólicos y estéticos complejos. En este sentido, la capacidad individual de comprender y valorar la alta cultura depende más de la educación que de los ingresos.

En cualquier caso, un precio alto (o unos ingresos bajos) también desaniman a las personas a consumir más contenidos culturales. Una posible solución para democratizar la cultura podría ser facilitar su acceso retransmitiendo espectáculos culturales a las audiencias a través de internet. Esto probablemente también tendría efectos positivos

en aquellos que carecen de tiempo suficiente como para consumir cultura en vivo, los cuales encontrarían los contenidos culturales en internet más fáciles de encajar en sus horarios. Además, las personas que sienten que el suministro de cultura está restringido por los costes de transporte seguramente también podrían beneficiarse de esta alternativa de consumo de cultura. En esta línea, el Capítulo 4 tiene como objetivo examinar la posibilidad de mejorar la participación cultural superando las restricciones económicas a través del consumo de cultura en internet.

Más concretamente, en el Capítulo 4, examinamos la relación entre el consumo en vivo y en línea de teatro y artes escénicas musicales. Nuestros resultados apuntan a dos perfiles diferentes de consumidores con respecto al canal de consumo (en vivo y en línea), pero también a una complementariedad entre el consumo en directo y a través de internet. Por lo tanto, el consumo en línea podría ser una herramienta valiosa para difundir el acceso a la cultura que podría ayudar a superar algunas restricciones de la asistencia cultural en vivo, como los precios altos y las restricciones de tiempo. Por el contrario, si únicamente aquellas personas que ya consumen cultura son las que utilizan internet para consumir aún más, pero no se logra atraer a nuevos consumidores, el canal de consumo en línea simplemente reproduciría los patrones habituales de desigualdad en el acceso, pero no ayudaría a democratizar el consumo de alta cultura.

En resumen, esta tesis doctoral es una investigación sobre la participación cultural en la que prestamos especial atención a los perfiles de los consumidores culturales. A lo largo de los cuatro ensayos, identificamos la educación como la principal variable explicativa para la asistencia cultural. Además, encontramos que la nueva era de la tecnología juega un papel cada vez más importante, pudiendo ayudar a facilitar el acceso a la cultura para todos los públicos.

CONCLUSIONS

Previous literature on cultural consumption has analyzed numerous issues regarding cultural participation and non-attendance from multiple perspectives. For a long time, many authors have tried to explain what determines cultural consumption and how to increase cultural participation among the public. The significant proportion of the population who do not consume culture regularly, or any culture at all, is still a major concern. This thesis adds to the state of the art by studying the profile of cultural consumers, exploring the main barriers to non-participation and how to boost consumption overcoming those limits. To this end, Chapters 1 and 2 are focused on determining the limits of attendance, whereas Chapters 3 and 4 aim to disentangle how to enhance cultural participation.

In Chapter 1 of this thesis, we study the main reasons why individuals do not attend more often contemporary music concerts and the cinema. Our main finding is that lack of interest acts as the main barrier to cultural consumption. Although excessive pricing is also a problem for cultural participation, our results suggest that economic restrictions are not the biggest problem. We suggest that it would be more useful to focus cultural policies on increasing the interest in cultural goods rather than on subsidizing prices. As lack of interest relates to the role of preferences and higher education is a key determinant in cultural consumption, long-term educational policies could be the answer to enhance cultural participation.

Chapter 2 analyzes the important disparities found between the declared motives of cultural non-participation in two successive waves of a Spanish opinion poll, namely, SCHP 2010-11 and SCHP 2014-15. The aim is to understand how the change of the *cultural* VAT that took place in Spain in 2012 affected cinema consumption. Before the tax change, the main declared reasons for not attending more frequently the movies were lack of interest, lack of time and high prices (30, 30 and 27 percent of the answers, respectively). After the tax change, high prices were declared as the main reason of non-participation by more than two thirds of the respondents. However, these complaints about prices were not consistent with cinema consumption, which remained stable before and after the change of the cultural VAT. Focusing on the analysis of cinema participation, we find that, interestingly, answers to evaluative (subjective) questions probably are (un)intentionally biased, whereas answers about (objective) behavior are more reliable than those regarding evaluations or opinions.

From Chapters 1 and 2, lack of interest, first, and then, high prices, were identified as the two key limits for cultural participation. Since the demand for culture is determined by experience processes, in which people develop their taste for culture through consumption (as explained in learning by consuming and rational addiction models), the problem of lacking interest in culture is probably connected with lack of knowledge and understanding. This is, in turn, closely linked with education. To unravel how to overcome this barrier, Chapter 3 explores the particularities of education as a limit for cultural consumption.

Education is the personal characteristic with the highest impact on cultural participation. First, because high education leads to more interest in culture and, second, because the higher the level of education, the higher the expected income, and high income is also related with attending cultural activities more often. In Chapter 3, we analyze the effect of education on attendance to cinema, performing arts and visits to sites of cultural interest. We find that the effect of education changes across activities, being its marginal effect larger for highbrow activities than for popular culture. By contrast, when a certain level of education is given, higher income increases participation to the cinema more than to theaters or museums. Probably, this relates to one particularity of highbrow cultural consumption: it involves the comprehension of complex symbolic and aesthetic elements, and, in this sense, individuals' ability to value and understand culture depends more on education than on income.

Nevertheless, high prices (or low earnings) also discourage people from consuming more cultural contents. One possible solution to democratize culture could be to facilitate its access by broadcasting spectacles to audiences on the internet. This would probably have also positive effects for those lacking time availability, who would find culture easier to fit in their schedule, timelines would be more flexible. Also, people who feel that the supply is restricted by travel costs could probably benefit from this alternative approach to consuming culture. In this line, Chapter 4 aims to examine the possibility of enhancing cultural participation overcoming economic restrictions through online consumption.

More specifically, in Chapter 4, we examine the relation between live and online consumption of theatre and musical performing arts. Our results point to two different profiles of consumers regarding the consumption channel (live and online), but also a complementarity between live and online consumption. Therefore, the online channel could be a valuable tool for spreading access to culture that might overcome some restrictions on live cultural participation, such as high prices and time constraints. Otherwise, if only those people already consuming culture are the ones using the internet

to consume more, but it does not help in attracting new consumers, the online channel would help just to reproduce old patrons of inequality in cultural access but not to democratize highbrow culture.

In summary, this dissertation is a research on cultural participation where we pay special attention to the profiles of cultural consumers. Throughout the four essays, we identify education as the main explanatory variable for cultural attendance. Additionally, we find that the new age of technology plays an increasingly important role, as it can help facilitating the access to culture for everyone.

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